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The Commonwealth of Massachusetts
Executive Office of Environmental Affairs
Department of Environmental Quality Engineering
Division of Hazardous Waste

SPILL NOTIFICATION REGULATIONS

Public Hearing Draft

Discussion Papers

[v.1]

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MASSACHUSETTS OIL AND HAZARDOUS MATERIALS SPILL NOTIFICATION REGULATIONS

Discussion Draft

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MASSACHUSETTS OIL AND HAZARDOUS MATERIALS SPILL NOTIFICATION REGULATIONS

Discussion Draft

A. INTRODUCTION

1.0 Purpose and Authority

This Discussion Draft proposes regulations to be promulgated under the authority of the Massachusetts Oil and Hazardous Material Release Prevention and Response Act (M.G.L. c. 21E). Section 3 of c. 21E authorizes the Department to "promulgate such regulations as it deems necessary for the implementation, administration and enforcement of the chapter." The proposed Massachusetts Oil and Hazardous Materials Spill Notification Regulations were developed by the Department and its Superfund Advisory Committee (SAC) in response to this mandate.

The proposed regulations identify those releases and threats of release of oil and hazardous material which constitute an emergency situation and for which notification to the Department, pursuant to c. 21E §7, will be required. Section 7 specifies that:

> "any owner or operator of a site or vessel, and any person otherwise described in paragraph (a) of section five (of the chapter), as soon as he has knowledge of a release or a threat of a release of oil or hazardous material, shall immediately notify the department." [1.]

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1. The following individuals are specified in paragraph (a) of section five of M.G.L. c. 21E and are required to notify the Department in the event of a release or threat of release of oil or hazardous material from their respective sites or vessels:

   (1) past owners or operators of sites upon which hazardous material was stored or disposed;

   (2) any person who arranged for the transport, disposal, storage or treatment of hazardous material to or in a site or vessel from or at which there is or has been a release or threat of release of hazardous materials

   (3) any person who directly or indirectly transported any hazardous material to transport, disposal, storage or treatment vessels or sites from or at which there is or has been a release or threat of release of hazardous material;

   (4) any person who otherwise caused or is legally responsible for a release or threat of release of oil or hazardous material from a site or vessel.

These notifications will alert the Department to releases and threats of release that may require rapid response to protect public health, safety, welfare, and the environment.

1.1 Relationship to Federal Notification Regulations

The U.S. Environmental Protection Agency first issued notification regulations under the authority of §102 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 (42 U.S.C. 9602) and §§311 and 501(a) of the Federal Water Pollution Control Act (33 U.S.C. 1321 and 1361). The purpose of the federal notification regulations is to

> "alert the appropriate government officials to releases of hazardous substances that may require rapid response to protect public health, welfare and the environment. Notification, based on reportable quantities is merely a trigger for informing the government of a release so that the appropriate federal personnel can evaluate the need for federal response action and undertake any necessary response in a timely fashion". (Vol. 50, No. 65, April 4, 1985, 13457)

The USEPA has also issued emergency notification regulations under the authority of the Emergency Planning and Community Right to Know Act of 1986, also known as Title III of the Superfund Amendments and Reauthorization Act (SARA) of 1986. These regulations, developed by the Agency's Chemical Emergency and Preparedness Program (CEPP) in the aftermath of the Bhopal chemical disaster, require immediate notification of the state emergency response commission (appointed by the Governor of each state) and the local emergency planning committee (which is in turn appointed by the state emergency response commission). If there is no local emergency planning committee, notification shall be provided to relevant local emergency response personnel. Appendix A of this Discussion Draft summarizes and compares the features of the Department's proposed Spill Notification Regulations with the CERCLA and Title III Notification Regulations.

The Department's proposed Spill Notification Regulations differ from both the Title III and CERCLA Notification Regulations in two ways. First, the Department's Oil and Hazardous Materials List is more inclusive than either the list of Extremely Hazardous Substances, which are part of the Title III notification regulations, or the CERCLA List of Hazardous Substances, which are part of both the Title III and CERCLA notification regulations. The Massachusetts List of Oil and Hazardous Materials includes both of these lists in their entirety as well as oil and a number of additional substances for which notification to the Department will be required in the event of a release or threat of release of oil or hazardous material.

The second difference between the Department's proposed notification regulations and the two federal notification regulations is that the Department is proposing to assign reportable quantities to the regulated materials that are in most cases significantly lower than those established by the federal regulations. The U.S. EPA has described the federally established reportable quantities as reporting triggers for informing the appropriate federal personnel of a release so that the need for a federal response action can be assessed (See FR VOL. 50, No. 65, 4/4/85). The Department believes there are a number of circumstances in which a release of a hazardous material in an amount less than its federally established reportable quantity could cause significant environmental impacts or present a threat to public health or public safety. The Department believes the proposed Spill Notification Regulations establish reportable quantities that will protect the resources of the Commonwealth more completely than the federal regulations.

1.2 Process for Developing the Spill Notification Regulations

With a commitment to encourage public participation in regulatory development, the Department established the c. 21E Advisory Committee (Superfund Advisory Committee) in May of 1985. Seventeen organizations, representing muni-

cipal, environmental, and industrial views and including two members of academia, were appointed to serve as committee members. As a group, the selected members were intended to represent the broadest possible range of interests in the policies and regulations developed under c. 21E.

Committee meetings, held monthly, have been open to any member of the public and have served as a forum for interested individuals and organizations to contribute their advice and viewpoints to the Department's rule making process. A comprehensive mailing list has been used to provide all interested parties with notice of committee meetings and to circulate meeting minutes, associated materials, and any records of decision. The work of the Superfund Advisory Committee, and a number of subcommittees established to address specific technical issues, has been invaluable in shaping a set of proposed regulations intended to reflect the broadest possible range of interest and concerns. The Department believes both the regulated community and the public will benefit from the discerning efforts of the Superfund Advisory Committee and its contribution to the clarity and utility of the proposed regulations.

1.3 Format of Discussion Draft

The Discussion Draft is intended to provide a framework for public discussion of the proposed Spill Notification Regulations. The remainder of the Discussion Draft contains six discussion papers which accompany each of the major sections of the proposed regulations. The discussion papers review the major issues that form the basis of the proposed regulations. Included are discussions of the various options considered by the Department in developing.

- definitions

- criteria for evaluating candidate substances for the Massachusetts Oil and Hazardous Materials List
- reportable quantities
- notification procedures

The Department's recommendations and the rationales for selecting particular options are presented. Attention is focused on issues for which the Department is specifically requesting comment.

C. DISCUSSION PAPERS

C-1. DISCUSSION PAPER I - GENERAL DEFINITIONS

1.0 Background

Definition of key terms appear in section 40.303 of the proposed Spill Notification Regulations. Included are a number of terms which are defined in M.G.L. c. 21E. Because the regulatory definitions of these terms are identical to the statutory definitions, they need not be discussed herein.

Certain new terms, however, had to be defined for the purpose of the Spill Notification Regulations. These terms include:

- "consumer product in consumer use"
- "reportable quantity"
- "sheen"
- "waste oil"

Discussion of each of these new terms follows.

1.1 New Definitions

1.1.1 "Consumer Product in Consumer Use"

Section 7 of c. 21E requires that any owner or operator of a site or vessel must notify the Department as soon as he has knowledge of a release or threat of release of a substance on the Massachusetts Oil and Hazardous Material List. Because, the statutory definition of "site" specifically excludes consumer products in consumer use, the Department is defining the phrase in order to clarify which releases or threats of release actually require notification.[2]

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2. Sites means any building, structure, installation, equipment, pipe or pipeline, including any pipe into a sewer or publicly-owned treatment works, well, pit, pond, lagoon, inpoundment, ditch, landfill, storage container, motor vehicle, rolling stock, or aircraft, or any other place or area where oil or hazardous material has been deposited, stored, disposed of or placed, or otherwise come to be located. The term shall not include any consumer product in consumer use or any vessel. (From M.G.L. c. 21E)

Options: For this definition, options focus on whether consumer use should end at disposal of the product.

° Option 1: **Consumer product in consumer use** means any product which is packaged or distributed for purposes of personal care or household use when used in the intended manner. The consumer use of a consumer product ceases when the product is discarded, disposed of, or abandoned.

° Option 2: **Consumer product in consumer use** means any product which is packaged or distributed for purposes of personal care or household use when used in the intended manner.

Recommendation: The proposed regulations use Option 2.

Regulations promulgated under M.G.L. c. 21C excludes household hazardous waste from regulation. The Department believes that requiring notification upon disposal of a consumer product that is either specifically listed on the Massachusetts Oil and Hazardous Materials List, or which exhibits the characteristics of ignitability, corrosivity, or reactivity would not be consistent with these regulations. In addition, as a practical matter, it would be unworkable to require and to enforce such notification.

Issues for Comment: The following issue has been raised by the Department and the Superfund Advisory Committee regarding this definition:

° Should disposal be considered part of consumer use?

1.1.2 "Reportable quantity"

The Department currently requires notification of a release or threat of release of any amount of oil or hazardous material as those terms are defined in the statute. The Spill Notification Regulations will modify this requirement by specifically identifying on the Massachusetts Oil and Hazardous Materials List those hazardous materials and oil for which notification is required. Reportable quantities will be assigned for each hazardous material and oil which appears on the Massachusetts Oil and Hazardous Materials List.

Options: Options for defining "reportable quantity" pertain to two issues:

(1) the period of time over which a release occurs (period of release; and

(2) The manner in which the release occurs (sudden, continuous or intermittent).

Establishment of a period of release would serve to restrict the notification requirement to those releases of reportable quantities which occur within the time specified. Including all manners of release in the definition would serve to bring a broad range of releases under the purview of the notification requirements.

Period of Release

° Option 1a: **Reportable quantity** means the quantity of oil or hazardous material the release or threat of release of which, in a 24 hour period, requires notification pursuant to these regulations, 310 CMR 40.000.

° Option 1b: Same as (1a) above with the addition of a "maximum total aggregate RQ". In addition to requiring that a release that occurs within a 24 hour period in excess of the reportable quantity be subject to notification, a period of time would be specified over which a release of a specified multiple

of the reportable quantity must also be reported. For example, the Department would require notification if five times the reportable quantity was released over the course of six months either as a result of a continuous or intermittent release. The Department has not determined the period of time or RQ multiple that would be most appropriate.

° Option 2: **Reportable quantity** means the quantity of oil or hazardous material the release or threat of release of which in a period of one week, requires notification pursuant to these regulations, 310 CMR 40.000.

° Option 3: **Reportable quantity** means the quantities of oil or hazardous material the release or threat of release of which requires notification pursuant to these regulations, 310 CMR 40.000, regardless of the time period over which the release occurs.

Recommendation: The proposed regulations use Option 2 which specifies a period of release of one week.

Manner of Release

° Option 1: **Reportable quantity** means the quantity of oil or hazardous material the sudden, continuous or intermittent release or threat of release of which, in a period of one week, requires notification pursuant to these regulations, 310 CMR 40.000.

° Option 2: **Reportable quantity** means the quantity of oil or hazardous material the sudden or continuous release or threat of release of which, in a period of one week, requires notification pursuant to these regulations, 310 CMR 40.000.

Recommendation: The proposed regulations use Option 1.

The Massachusetts Notification Regulations will serve as a mechanism by which the Department will be informed of releases or threats of release of oil or hazardous material that may require an emergency response. These releases are typically sudden, discrete and accidental. However, the Department is also concerned about chronic releases that may result from faulty equipment or design failures. These releases may be slow and continous or occur intermittently only when valves are opened or deliveries are made which raise the levels of stored product to parts of the tank where fractures or holes may be present. These releases have the potential to accumulate over time and threaten public health, safety and the environment to the same degree as releases from discrete incidents. The Department is therefore proposing to require notification of releases in excess of their respective reportable quantity regardless of whether the release was continuous, sudden or intermittent.

Concern has been raised that there may be situations for which a determination of the amount of an intermittent release may be impractical and, in fact, outside the Department's area of concern.

With regard to the period of release, the proposed regulations use a one week period of release because the Department believes a 24 hour period of release would serve to exclude a number of releases that may represent substantial threats to public health, safety, and the environment for which an immediate response is required. The Department further believes that it is necessary to specify some period of release to avoid the absurd requirement that releases that take months or years to reach the reportable quantity be quantified and reported when the reportable quantity has been reached.

The Department acknowledges that the period of time used to define a release for which notification is required is somewhat arbitrary. There may be releases equal to or in excess of the reportable quantity that occur within a period of one week that do not constitute an emergency situation just as there may be releases equal to or in excess of the reportable quantity that accumulate in a period of time longer than one week that do constitute an emergency. For these situations the Department proposes that if an emergency exists, regardless of the period of time over which the release occured, the owner or operator of the site or vessel from which the release originates shall notify the Department immediately. Similarly, the Department shall also be notified immediately if the period of release is not known though the quantity of the release is known to be equal to or in excess of the reportable quantity.

Issues for Comments: With regard to the definition of "reportable quantity" the Department wishes to focus attention on the following issues:

° Though the statute clearly requires that the Department be notified of threats of release in addition to actual releases in order to be given the opportunity to respond in a preventive manner, the Department recognizes that the determination of whether a situation represents a "threat of release" is frequently subjective. The extent to which a release is imminent if a situation is left unattended is often a function of time, materials, weather and a number of other variables that may be indeterminable. Referring to the statutory definition of threat of release, it is the Department's intent to require notification of circumstances for which there is a substantial likelihood of a release which requires action to prevent or mitigate damage

to the environment which may result from such a release. The Department offers the following guidance for determining whether a threat of release exists and notification of the Department is required. Threats of release include but are not limited to:

(1) Site or vessels which contain an oil or hazardous material in an amount equal to or in excess of its reportable quantity at which corrosion or some other damage is visible or known to exist and could result in a release of a reportable quantity; and

(2) Malfunctioning delivery hoses, pumps or other equipment through which oil or hazardous materials pass in amounts equal to or in excess of their respective reportable quantities and from which a release to the environment could result.

In consideration of these points is there a need to specify additional situations that may represent "threats of release"?

° The Department acknowledges that there may be situations, for which a determination of an intermittent reportable quantity may be impractical and, in fact, outside the Department's area of concern. For example, intermittent releases could be interpreted to apply to daily losses from properly functioning gasoline pumps at gasoline stations. The Department recognizes that requiring that these releases be added up and reported when the reportable quantity has been reached would be an inappropriate application of the statute. Given that the purpose of the Spill Notification Regulations is to inform the Department of releases or threats of release of oil or hazardous material that may require an emergency response to protect public health safety or the environment, are there any other anomolous results which could arise from requiring notification of continuous or intermittent releases? The Department welcomes language that could eliminate these anomolies.

- What (if any) problems could arise as a result of specifying a one week period of release?

1.2.3. "Sheen."

The Department is proposing to use the term sheen as a non-quantitative reporting trigger for releases of oil. The term was originally developed under the authority of section 311 of the CWA.

Options: There are two issues with regard to the definition of the term "sheen".

- Should the term apply only to petroleum based oil (including waste oil) or should it include animal, vegetable and synthetic oil?

- Should the term apply to "Waters of the Commonwealth" as defined in c. 21E or to "navigable waters" as defined in §502 of the Federal Water Pollution Control Act? (FWPCA)? Chapter 21E defines "Water of the Commonwealth" as follows:

> "Waters of the commonwealth", all waters within the jurisdiction of the commonwealth, including, without limitation, rivers, streams, lakes, ponds, springs, impoundments, estuaries, coastal waters and groundwaters. The term shall not include impoundments of chemical wastes.

The Federal Water Pollution Control Act defines navigable waters as: "Waters of the United States, including the territorial seas". Additionally, the U.S Coast Guard has determined that the concept of "navigability" encompasses the entire riverine system within the United States extending upstream to the sources,

whatever and wherever they may be. A discharge needs simply to occur into waters which are part of the hydrological cycle (e.g., a discharge of oil into a catch basin which empties into a brook which then leads to a river which flows on to the ocean) to be considered a discharge into the navigable waters of the United States. The term does not include groundwater.

° Option 1a: **Sheen** means an iridescent appearance of petroleum based oil on the surface of any of the "Waters of the Commonwealth".

Option 1b: **Sheen** means an iridescent appearance of any oil on the surface of any of the "Waters of the Commonwealth".

Option 1c: Sheen **means** an iridescent appearance of any oil on the surface of any river, stream, lake, pond, spring, impoundment, estuary, or coastal water.

The difference between this definition and 1b is that all bodies of water, except groundwater, which are referred to in the definition of "Waters of the Commonwealth, are specifically listed.

Option 2a: **Sheen** mean an iridescent appearance of petroleum based oil on the surface of any navigable waters.

Option 2b: **Sheen** means an iridescent appearance of any oil on the surface of any navigable waters.

Recommendation: The proposed regulations use Option 1c.

A number of the Department's programs have adopted the definition of "Waters of the Commonwealth", which appears in a number of statutes in addition to c.21E, in carrying out their mandates to protect water resources.
For example, the Department's Water Pollution Control Regulations (310 CMR 14)

require notification of any unpermitted discharge to the "Waters of the Commonwealth". The Department believes it should also extend the protection provided by the Spill Notification Regulations to these same water resources. The only functional difference between the terms "waters of the commonwealth" and "navigable waters" is that "navigable waters" do not encompass groundwater or lakes and ponds that do not drain to the ocean. This Department is concerned about discharges of oil to lakes and ponds that do not drain to the ocean and would want to receive notification of these incidents.

Concern has been raised that use of the term "Water of the Commonwealth" would result in the requirement that groundwater be monitored on a regular basis to determine whether a sheen is present. It is not the Department's intention to require monitoring of groundwater by means of the Spill Notification Regulations. For this reason, the Department is proposing to list all bodies of water encompassed by the term "Waters of the Commonwealth" except for groundwater in the definition of "Sheen". The Department believes Option 1C clarifies the intent of the Spill Notification Regulations and maintains the fullest protection of all bodies of waters within the Commonwealth.

Concern has also been raised that use of the term "sheen" as a non-quantitative reporting trigger for any of the Waters of the Commonwealth could be extended to include any puddle or parking lot on which a sheen appeared. The Department acknowledges this concern and believes that Option 1c clarifies its intent to not require notifications of sheens which appear on either puddles in parking lots or highways following a rainfall.

Issues for Comment:

° The Department wishes to solicit comment with regard to whether the term "sheen" should apply to "Waters of the Commonwealth" excluding groundwater, or "navigable waters" and whether the term should cover only petroleum based oil rather than both petroleum and non-petroleum based oil.

° Could the Department's proposed definition have any incongruous results or does it require further clarification?

1.2.4. "Waste Oil"

The authority of M.G.L. c. 21E covers to both hazardous materials and oil. Because the statutory definition of oil in that statute specifically excludes waste oil, and it is the Department's intention to regulate this material, a definition of "waste oil" was developed.

° Options: Options for this term focus on whether for purposes of the Spill Notification Regulations the definition of "waste oil" should be a composite of the definitions of "unused waste oil" and "used waste oil" as these terms appear in The Massachusetts Hazardous Waste Management Regulations (310 CMR 30.000) or should it include only the definition of "used waste oil".

° Option 1: **Waste Oil** is comprised of all petroleum based "unused waste oil" and "used waste oil" as those terms are defined in 310 CMR 30.010:

Unused Waste Oil means waste oil that is superfluous or abandoned fuel, storage tank bottoms, cleanout sludge, sludge from the separation of unused oil from a non-hazardous waste, contaminated oil resulting from a cleanup of a release of oil, and any other waste oil that is not used waste oil.

Used Waste Oil means used and/or reprocessed, but not subsequently re-refined, waste oil that has served its original intended purpose. Such oil includes, but is not limited to, fuel oil, engine oil, gear oil, cutting oil, transmission fluid, and dielectric fluid.

° Option 2: Waste Oil is comprised of all petroleum-based "used waste oil" as that term is defined in 310 CMR 30.010.

Recommendation: The proposed regulations use Option 1.

The definitions of "used waste oil" and "unused waste oil" circumscribe a universe of substances for which the Department has established regulations which pertain to their handling and disposal. The Department believes that though these definitions were originally developed for a different purpose, their inclusiveness serves the intent of the the Notification Regulations to cover materials considered hazardous to public health, safety, welfare, and the environment. Adoption of the definitions of "unused waste oil" and "used waste oil" from the Massachusetts Hazardous Waste Management Regulations also facilitates consistency among the Department's various programs and insures that the regulated community will recognize a particular universe of substances as regulated substances.

It has been argued that though they are of concern to the Department, the substances encompassed by the definition of unused waste oil are not actually wastes but rather abandoned or spilled oil and should therefore be regulated as oil rather than waste oil. The Department finds merit in this argument and, for notification purposes, is proposing that the reportable quantity for unused waste oil be 10 gallons (i.e equivalent to that of other petroleum based oils). The reportable quantity for "used waste oils", on the other hand, will be 5 gallons (see section 4.4.4).

Issues for Comment:

° Does the proposed definition of waste oil cover all oils for which the Department should require notification? is the distinction between "unused waste oil" and "used waste oil" meaningful for the purposes of notification?

C-2. DISCUSSION PAPER II - IDENTIFICATION AND LISTING OF HAZARDOUS MATERIAL

2.0 Background

The Spill Notification Regulations will identify those hazardous materials which, upon release into the environment, may adversely affect public health, safety, welfare or the environment. The Department is proposing two mechanisms for identifying hazardous materials. Based on the general criteria described in 2.1 below these mechanisms are as follows:

1. development of specific criteria used to evaluate candidate substances for inclusion on the Massachusetts Oil and Hazardous Materials List; and

2. development of characteristics which will be used to identify hazardous materials that are not specifically listed on the Massachusetts Oil and Hazardous Materials List.

The general criteria form the basis of both the specific criteria used to evaluate candidate substances and the characteristics of hazardous material that are not specifically listed. The following sections describe the general criteria, specific criteria, and characteristics which serve to identify regulated hazardous materials.

2.1 General Criteria for Identifying Hazardous Materials

The Department has used both general and specific criteria to determine whether to regulate a substance as a hazardous material. The general criteria are (1) the statutory definition of hazardous material and (2) the extent to which other state or federal agencies have identified an element or compound as hazardous.

The specific criteria used to evaluate candidate hazardous materials for inclusion on the Massachusetts Oil and Hazardous Materials List and the characteristics which define those hazardous materials, which are not specifically listed but which are subject to the Spill Notification Regulations because they exhibit these characteristics, are based on the definition of hazardous material.

The definition of "hazardous material", in MGL c. 21E, includes materials that exhibit "corrosive, flammable, reactive, toxic, infectious, or radioactive characteristics."

The Department is proposing to not require notification of releases of radioactive materials as these releases are currently handled by four agencies the Massachusetts Department of Public Health (DPH), the U.S. EPA, U.S. Nuclear Regulatory Commission (NRC), and the Department of Transportation (DOT). The proposed Spill Notification Regulations do not require notification of a release of radioactive material because the Department believes these releases to be adequately regulated by these four agencies.

Infectious materials will be subject to the notification requirements of 310 CMR 40.500. A discussion of the definition of these materials, which will function as a characteristic of unlisted hazardous material, appears in section 2.3.3.

2.2 Specific Criteria for Evaluating Substances

The Superfund Advisory Committee worked with the Department to develop a set of criteria with which to evaluate candidate substances for inclusion on the Massachusetts Oil and Hazardous Materials List. Based on both scientific and regulatory precedents, the Department identified a set of criteria to screen substances on the basis of considerations of public health, environmental quality and public safety.

Regulations and standards for the control of toxic chemicals in the ambient environment which are designed to protect the public health are typically based on the acute toxicity and chronic toxicity of the chemicals. The carcinogenic

and mutagenic effects of these substances are often considered as well when establishing guidelines to protect public health. The Department's criteria for evaluating candidate substances, in terms of their effects on public health, consider each of these effects as follows:

- acute toxicity (aquatic and mammalian)
- chronic toxicity
- carcinogenicity
- mutagenicity

Characteristics of hazardous materials and hazardous wastes, that, when improperly managed, represent a potential hazard to public safety have been defined by the Department of Transportation (DOT) (see 49 CFR Part 171) and the U.S. EPA (40 CFR §261.21 - 261.24 (EPA)). The DOT Hazardous Materials Table (49 CFR §172.101) and EPA's List of Hazardous Wastes (40 CFR Subpart D Part 261) are based upon the characteristics of flammability or ignitability (the terms are synonymous in the DOT and EPA regulations) and corrosivity. EPA also considers reactivity in regulating hazardous waste. The Department proposes to identify substances which represent a potential threat to public safety by using all three of these characteristics.

2.2 Defining and Applying the Specific Criteria

Once criteria for evaluating candidate substances were identified, the methodologies were developed for applying the criteria to those substances. To evaluate substances on the basis of acute toxicity, thresholds, determined by LC_{50} and LD_{50} values were used.[3] To evaluate substances on the basis of chronic toxicity, carcinogenicity or mutagenicity, methods for classifying substances

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3. LD_{50} refers to that dose of a substance expected to cause death of 50 per cent of a defined experimental population. LC50 refers to that concentration of a substances in the air which is expected to cause the death of 50 percent of a defined experimental population or which is lethal to one half of the test population upon continuous exposure for 96 hours.

on the basis of these criteria were established. The weight of the evidence available from both epidemological and animal studies was assessed and the potency of the substances, as exhibited in these studies, was evaluated. To apply the public safety criteria, definitions of flammability/ignitability, corrosivity and reactivity were established.

In the following sections each of the public health and public safety criteria are discussed individually. The options considered for defining each of the criteria and selecting methodologies for applying the criterion to evaluate candidate substances are discussed. The Department's recommendations and associated rationales are also presented. In addition, issues upon which the Department is specifically requesting comment are noted. Though the following discussion describes the criteria used by the Department to evaluate substances which appear on the proposed Massachusetts Oil and Hazardous Materials List, the Department reserves the right to define additional criteria for any future additions to the List when warranted by scientific evidence. Any hazardous materials identified by such additional criteria would be proposed to be added to the list in accordance with G.L. c. 30A.

2.2.1 Public Health Criteria

2.2.1.1 ACUTE TOXICITY

The Department is proposing to list and require notification of releases or threats of release of substances which have been shown to exhibit acutely toxic effects. Acute toxicity is defined as the occurrence of adverse health effects which develop within a reasonably short period of time after exposure to a single dose or multiple doses of a substance. (CHEM, p. 95).[4]

Options: The options considered for the purpose of evaluating candidate substances on the basis of acute toxicity focus on whether the threshold values adequately included of substances of concern.

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4. See Chemical Health Effects Methodology and the Method to Derive Acceptable Ambient Levels, developed by the Department of Environmental Quality Engineering's Office of Research and Standards, in press.

Option 1: EPA has developed a methodology used to screen candidate substances for inclusion on the CERCLA list of Hazardous Substances on the basis of acute toxicity. The maximum values that appear in Table 2-1 below are used by EPA as thresholds to determine whether a substance should be listed. For example, substances which exhibit an LD50 for mammalian populations of less than 500 mg/kg via oral exposure would be listed on the CERCLA List of Hazardous Substances. Substances which exhibit an LC50 for mammalian populations of less than 200 ppm via inhalation would also be listed. The Department is proposing to adopt the upper threshold value, or that LD_{50} or LC_{50} which would qualify a substance for listing on the CERCLA list of Hazardous Substances to list substances on the Massachusetts Oil and Hazardous Materials List on the basis of acute toxicity. Substances with an LD_{50} or LC_{50} at or below the threshold or maximum values in Table 2-1 would be listed on the Massachusetts Oil and Hazardous Materials List.

Option 2: Chose another set of threshold values based on a review of threshold values currently used by other agencies to regulate substances on the basis of acute toxicity.

Recommendation: The proposed regulations use Option 1.

Table 2-1[5]

Route of Exposure	Type of Measure	Maximum Value
Oral mamalian	LD_{50}	<500 mg/kg. or
Dermal mammalian	LD_{50}	<2000 mg/kg, or
Inhalation mamalian	LC_{50}	<200 ppm, or
Aquatic toxicity	LC_{50}	<500 mg/l.

The threshold values described in Table 2-1 were found to be consistent with scientific and regulatory precedents for regulating substances on the basis of acute toxicity.[6] For this reason both the Department and the Superfund Advisory Committee support adopting the upper thresholds from the EPA methodology for acute toxicity as an adequate screening mechanism.

5. See 43 FR 10492, 3/13, 1978 for a detailed explanation of the derivation of these threshold values.
6. Casarett and Doull, Toxicology, The Basic Science of Poisons, MacMillan Publishing Company, 1986.

Issues for Comments: The Department invites comments on all aspects of this criterion including:

° Do the threshold values sufficiently include substances that should be listed on the Massachusetts Oil and Hazardous Materials List?

2.2.1.2 CHRONIC TOXICITY

Chronic toxicity is defined as the occurence of adverse effects that develop and persist over time after exposure to a single dose or multiple doses of a substance. The Department is proposing to list and require notification of releases or threats of release of substances which have been shown to cause chronic toxicity. In so doing the Department considered the following two options for evaluating candidate substances.

Options: The options for this criterion consider the limitations of methodologies that either do not consider all routes of exposure or for which data, consistent with the format of that methodology, may be limited.

° Option 1: Adopt the means of evaluating chronic toxicity that is used in EPA's methodology for assigning reportable quantities to substances on the CERCLA List of Hazardous Substances. Substances are evaluated on the basis of minimum effective dose (MED) and severity of effects and assigned a score of 1-10 for each parameter. Substances having toxic effects at a low dose (i.e., those that are more highly toxic) will be given a higher MED score, while those requiring a high dose (i.e., those that are less toxic) will be given a lower score. A score will also be given on the basis of the severity of biological effects exhibited at the minimum effective dose (See table 2-2). These effects range from certain biochemical changes in the absence of pathological changes or changes in organ weights (considered least severe with a score of 1) to neuropathy with a measurable change in behavioral, sensory or physiologic activity (score of 7) to death or pronounced life shortening (score of 10).

TABLE 2-1 - SEVERITY OF EFFECTS RATING VALUES [7.]

RATING	EFFECT
1	Enzyme induction or other biochemical change with no pathologic changes and no change in organ weights.
2	Enzyme induction and subcellular proliferation or other changes in organelles but no other apparent effects.
3	Hyperplasms, hypertrophy or atrophy but no change in organ weights.
4	Hyperplasma, hypertrophy, or atrophy with changes in organ weights.
5	Reversible cellular changes: cloudy swelling, hydropic change, or fatty changes.
6	Necrosis, or metaplasia with no apparent decrement of organ function. Any neuropathy without apparent behavioral, sensory, or physiologic changes.
7	Necrosis, atrophy, hypertrophy, or metaplasia with a detectable decrement of organ functions. Any neuropathy with a measurable change in behavioral, sensory, or physiologic activity.
8	Necrosis, atrophy, hypertrophy, or metaplasia with definitive organ dysfunction, any neuropathy with gross changes in behavior, sensory, or motor performance. Any decrease in reproductive capacity. Any evidence of fetotoxicity.
9	Pronounced pathologic changes with severe organ dysfunction. Any neuropathy with loss of behavioral or motor control or loss of sensory ability. Reproductive dysfunction. Any teratogenic effect with material toxicity.
10	Death or pronounced life shortening. Any teratogenic effect without signs of maternal toxicity.

7. From Methodology and Guidelines for Ranking Chemicals Based on Chronic Toxicity Data, prepared for Office of Emergency and Remedial Response by Environmental Criteria and Assessment Office, November 1984.

Scores for minimum effective dose and severity of effects are multiplied; a substance would be added to the Massachusetts Oil and Hazardous Materials List if it received a composite score equal to or greater than one.

Option 2: Use the chronic toxicity evaluation method developed by the Department's Office of Research and Standards (ORS) in its Chemical Health Effects Methodology (CHEM). This methodology assigns "Most Appropriate Occupational Levels" (MAOLS), based on a review of exposure limits derived from occupational settings. The occupational limits represent permissible exposures for healthy adult workers in controlled settings (CHEM, p.70). A severity factor is also assigned. Like the EPA method, a toxicity score for each chemical is assigned on the basis of a matrix approach using the MAOL and a severity of effects factor. The severity of effects factor is based on the biological effects exhibited at the MAOL.

Recommendation: The Department has not evaluated any substances on the basis of chronic toxicity for inclusion on the proposed Massachusetts Oil and Hazardous Materials List but is proposing to use both CHEM and EPA's methodology for any future evaluations of candidate substances to the Massachusetts Oil and Hazardous Materials List.

The Department believes the EPA's method for evaluation of chronic toxicity to be particularly sensitive to the relative environmental hazards posed by each chemical. The method is able to differentiate between substances that may require similar minimum effective doses to cause chronic toxicity but still have very different effects. However, EPA is the only agency currently interpreting chronic toxicity data using this system. The review process used by EPA to assign scores has not yet been published. "Scored" data are only available for a few substances that appear on the CERCLA List of Hazardous Substances and these substances have been automatically listed on the Massachusetts Oil and Hazardous Materials List. As the EPA methodology for evaluating substances on the basis of chronic toxicity, including any "scored" data, become available,

the Department will review this information and determine whether any additional substances should be added to the Massachusetts Oil and Hazardous Materials List in the future.

The methodology derived by the Office of Research and Standards, for evaluating substances on the basis of chronic toxicity is similarly sensitive to the relative hazards posed by individual chemicals, but it is limited in that it does not not include a mechanisof or evaluating chronic toxicity on the basis of ingestion or dermal exposure directly. However, the Department plans to expand the methodology and believes CHEM provides a scien tifically defensible means of evaluating the chronic toxicity of substances in a variety of release situations. Together the EPA methodology and CHEM take advantage of a variety of data to evaluate substances on the basis of chronic toxicity. The Department is proposing to use both methodologies to determine whether any additional substances should be added to the Massachusetts Oil and Hazardous Materials List in the future.

- ° Should the Department consider any other methodologies appropriate for evaluating chronic toxicity?

2. 2.1.3 CARCINOGENECITY

A carcinogen is defined as any substance or mixture of substances which causes either an increased incidence of benign and/or malignant tumors or a substantial decrease in the latency period between exposure and onset of tumors in humans or in one or more experimental species.[8] An uncontrolled release of any carcinogens to the ambient environment may represent a serious public health threat. The Department, therefore, is proposing to list and require notification of releases or threats of release of potential carcinogens.

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8. From the Chemical Health Effects Methodlogy and the Method for deriving acceptable ambient levels, developed by the Department of Environmental Quality Engineering's office of Research and Standards, in press.

Options: The following options focus on whether substances for which evidence of carcinogencity is considered "inconclusive" should be evaluated on a case-by-case basis and considered for listing on the Massachusetts Oil and Hazardous Materials List. The EPA's methodology for assigning reportable quantities on the basis of carcinogencity is compared to the Chemical Health Effects Methodology developed by the Department's Office of Research and Standards.

° Option 1: Adopt the carcinogen assessment method which appears in the Chemical Health Effects Methodology (CHEM) developed by the Department's Office of Research and Standards. The carcinogen assessment method combines estimates of weight-of-evidence (the amount of evidence that exists to indicate that the chemical produces that effect) and carcinogenic potency. Table 2-3 (on pg. 28) describes the classification of evidence for carcinogenicity, in which a wide array of data, including clinical, occupational, and epidemiological, as well as bioassays in experimental animals, are evaluated according to their relevancy to humans.

Carcinogenic potency is expressed in terms of lifetime excess cancer risk for experimental species per unit dose for each chemical. The unit risk estimate is then compared to the following broad groupings of risk values established by the Department for scoring purposes.

Table 2-4 [8]

Potency	Unit Risk
Very high	Unit risk is greater than or equal to 1/1000
High	Unit risk is between 1/1000 and 1/10,000
Moderate	Unit risk is between 1/10,00 and 1/1,000,000
Low	Unit risk is less than 1/1,000,000

8. Unit risk represents the estimated increase in the incidence of cancer that would result from a lifetime exposure. For example, a unit risk of $1X10^{-3}$ would result in an increased cancer risk of 1 in every 1000 people exposed to 1 mg/m3 of the chemical over a 70 year lifetime.

TABLE 2-3 Categorization of Overall Weight-of-Evidence for Human Carcinogenicity [9]

Category	Description of Evidence
Group A - Human Carcinogen	- sufficient evidence from epidemiological studies to support a causal association between exposure to the agent and cancer (Sufficient Human Evidence)
Group B - Probable Human Carcinogen	
B1	- limited human evidence and any animal evidence
B2	- sufficient animal evidence and no or inadequate human evidence
Group C - Possible Human Carcinogen	- limited animal evidence and no or inadequate human evidence
Group D - Not Classifiable as to Human Carcinogenicity	- no or inadequate animal and human data
Group E - Inconclusive	- available evidence cannot be classified as clearly showing the absence or presence of a carcinogenic effect because of major limitations in qualitative and quantitative data. However, the quantitative data is sufficient to estimate the upper bound of potency at the 95% confidence limit.
Group F - Non-positive	- no evidence in animals or in both animals and human

9. From the Chemical Health Effects Assessment Methodology and the Method for Deriving Acceptable Ambient Levels, developed by the Department of Environmental Quality Engineering's Office of Research and Standards, in press.

As a relative measure of carcinogenic hazard weight-of-evidence and unit risk estimates are combined to provide an overall letter code score (A-F) for carcinogenicity for each chemical. Table 2-5 describes this scoring system. The following are examples of how to interpret this table. Substances considered probable human carcinogens (Group B1 or B2) and for which the unit risk estimate is greater than or equal to $1x10^{-4}$ will be assigned the letter code A. Substances considered possible human carcinogens (Group C) and for which unit risk is estimated to be greater than or equal to $1x10^{-6}$ but less than $1x10^{-4}$ will be assigned the letter code C. In this option for evaluating substances on the basis of carcinogenicity, substances that fall within categories A-D, each of which is associated with particular weight of evidence category and unit risk estimate value, would be added to the Massachusetts Oil and Hazardous Materials List.

° Option 2: Adopt the CHEM carcinogen assessment method but, in this option, substances which fall within categories A-D would be automatically added to the Massachusetts Oil and Hazardous Materials List and substances within category E would be evaluated on a case-by-case basis. Category E is associated with substances for which evidence of carcinogenecity has been defined as inconclusive (See Table 2-5).

° Option 3: Adopt the EPA's carcinogen assessment scheme which assigns potential carcinogens to potency groups (high, medium, or low) based on an assessment of both weight of evidence and potency (see table 2-6). Group 1 includes those substances with the highest potencies. Other potential carcinogens with medium and low potencies are placed in Groups 2 and 3 respectively.

Table 2-5. Scoring Matrix for Carcinogenicity[10]

Weight-of-Evidence Category	Unit Risk Estimate	Letter Code
Human Carcinogen (Group A)	Any	
Probable Human Carcinogen (Group B1 or Group B2)	Unit Risk greater than or equal to 1/10,000	A
Possible Human Carcinogen (Group C)	Unit Risk greater than or equal to 1/1000	
Probable Human Carcinogen (Group B1)	Unit Risk is less than 1/10,000	
Probable Human Carcinogen (Group B2)	Unit Risk is between 1/10,000 and 1,000,000	B
Possible Human Carcinogen (Group C)	Unit Risk is between 1/1000 and 1/10,000	
Probable Human Carcinogen (Group B2)	Unit Risk is less than 1/1,000,000	
Possible Human Carcinogen (Group C)	Unit Risk is between 1/10,000 and 1/1,000,000	C
Possible Human Carcinogen (Group C)	Unit Risk is less than 1/1,000,000	D
Inconclusive (Group E)	Not used for scoring	E
Non-positive (Group F)	Not Available or Applicable	F
Inadequate or No data (Group D)		ND

10. Letters designating weight of evidence should not be confused with letters designating score shown in the last column.

Table 2-6 - EPA's Carcinogen Hazard Ranking[11]

Weight-of-evidence group[12]	Potency group		
	1 (highest)	2	3
A	High	High	Medium
B	High	Medium	Low
C	Medium	Low	Low
D	No hazard ranking is made		
E	No hazard ranking is made		

Recommendation: The proposed regulations use Option 2.

Rationale: The Department believes that there is strong scientific precedent for categorizing substances according to weight of evidence and that calculating risk estimates based on potency values is scientifically defensible and allows comparison of the relative hazard among groups of chemicals. The EPA methodology for evaluating carcinogens (released 3/6/87, see FR Vol. 52, No. 50) is also based on both weight of evidence and unit risk estimates. The Department is evaluating the similarities and differences in the way EPA and the Department rank carcinogens. It is clear that the EPA methodology was specifically developed for the purpose of assigning reportable quantities rather than simply for designating substances as potential carcinogens. The Department is proposing to list all substances for which there is evidence of carcinogenicity, including substances for which evidence is not conclusive as to human carcinogenicity

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11. For further explanation see FR VOl. 52, No. 50, 3/16/87
12. EPA's weight-of-evidence categories are defined as follows:
    A - known human carcinogen; B - probable human carcinogens;
    C - possible human carcinogen; D - not classified for human carcinogenicity;
    E - evidence of non-carcinogenicity for humans.

on the basis of animal studies. The EPA methodology does not include these substances in its hazard ranking system. Though the Department will further investigate the EPA methodology, the proposed Massachusetts Oil and Hazardous Materials List will include substances evaluated according to the CHEM carcinogen assessment method.

With regard to the inclusion of substances that fall within letter code E on the Massachusetts Oil and Hazardous Materials List evidence is often considered "inconclusive" because the testing was flawed rather than because the substance is non-carcinogenic. For example, even though an increase in tumors among the test population was exhibited, a number of the animals may have died before the study was completed and were not included in the final data. In these cases the tumor incidence rate was not considered statistically significant, therefore, the evidence was considered "inconclusive". The Department does not believe these substances should be automatically eliminated from consideration for designation to the Massachusetts Oil and Hazardous Materials List on the basis of carcinogenicity. Based on a case-by-case evaluation of substances for which evidence of carcinogenecity is considered inconclusive, including an assessment of the specific reason why evidence has been classified as such, a determination of whether to list this substance on the Massachusetts Oil and Hazardous Materials List will be made.

Issues for Comments:

- Is there any other information available to support or refute the inclusion of substances that fall within category E on the Massachusetts Oil and Hazardous Materials List?

- Should the Department consider any other methodologies, for evaluating substances on the basis of carcinogenecity?

2.2.1.4 MUTAGENICITY

A mutagen is defined as a chemical capable of inducing alterations in the genetic material of either somatic or germinal cells. Altered mutation rates can affect not only morbidity and mortality in the present, but also in the case of damage to germinal cells, the viability of future generations. For this reason, the Department proposes to include mutagens on the Massachusetts Oil and Hazardous Material List.

Options: The options for this criterion focus on whether candidate substances should be evaluated on the basis of mutagenicity itself or whether the criteria of chronic toxicity and of carcinogenecity are adequate screens for these substances.

° Option 1: Adopt the mutagen assessment method which appears in the Chemical Health Effects Methodology (CHEM) developed by the Department's Office of Research and Standards. Chemicals are classified according to the weight of the evidence that the chemical is a mutagen. To this end, results of a number of long-term and short-term tests are evaluated. Those tests with the greatest significance to humans, i.e., mammalian in vivo tests, are given the greatest weight and assigned to Group I. Short term mutagenicity screening assays, including both in-vivo and in-vitro methods, are classified in Groups II and III. Based on the number of positive and negative tests in each group, evidence of potential mutagenicity is classified as sufficient (letter code A), substantial (B), suggestive (C), limited (D), inadequate (E) or non-positive (F). For example, in order for evidence to be considered sufficient that a chemical is a mutagen, one of the following combinations of tests described in Table 2-7 must be available:

Table 2-7 - Scoring for Mutagenicity

Number of Positive Tests Required		Group Designation (based on relevance to humans)
Two or More	from	Group I or
Four or More	from	Group II or
Six or More	from	Group III or
One	from	Group I and
One or More	from	Group III or
One	from	Group I and
Two	from	Group III

Substances that score within letter codes A-D would be designated to the Massachusetts Oil and Hazardous Materials List.

° Option 2: Do not specify mutagenicity as a separate criterion of hazardous materials, but assume that mutagens are covered by the carcinogenicity and chronic toxicity criteria.

Recommendation: The proposed regulations use Option 1.

The federal notification regulations do not require notification of substances on the basis of mutagenicity. However, the Department believes the short-and long-term health effects of mutagens warrant the Department's notification in

the event of a release of these materials. With regard to option 2, though many carcinogens have also been shown to be mutagens, not all mutagens have been shown to be carcinogens. While experimental data demonstrate a correlation between mutational effects and carcinogenecity, the criterion of carcinogenicity is not believed to be a substitute for the criterion of mutagenicity. For this reason the Department proposes adopting mutagenicity as a separate criterion for evaluating candidate substances for addition to the Massachusetts Oil and Hazardous Materials List.

Issues for Comment: The Department invites comments on all aspects of the mutagenicity criterion.

2.2.2 Public Safety Criteria

2.2.2.1 FLAMMABILITY/IGNITABILITY

This criterion identifies those substances which are easily ignitable, may burn persistently or form a flammable mixture when mixed with air. If released to the environment, these substances may represent a serious threat to public safety.

Options: In developing a definition of flammability/ignitability that can be used to identify substances that should be added to the Massachusetts Oil and Hazardous Materials List, the Department reviewed definitions from the Hazardous Materials Regulations promulgated by the Department of Transportation under the Hazardous Materials Transportation Act (HMTA) (49 CFR, Parts 171 to 177) and the Hazardous Waste Regulations promulgated by EPA under the Resource Conservation and Recovery Act (RCRA) (40 CFR, Part 240 to 280). These definitions cover flammable liquids, solids, gases and oxidizers. The term "flammable" and "ignitable" used by DOT and RCRA respectively, essentially cover the same materials. The following options were considered:

° Option 1: Adopt the RCRA definition of **ignitability** from 40 CFR §261.21

which includes the following:

a. liquids, other than aqueous solutions, containing less than 24 percent alcohol by volume with a flash point of less than 60°C (140°F);

b. non-liquids capable under standard temperature and pressure, of causing fire through friction, absorption of moisture or spontaneous chemical changes and, when ignited, burns so vigorously and persistently that they create a hazard;

c. ignitable compressed gases as defined in 49 CFR 173.300. (See Option 2)

d. oxidizers defined in 49 CFR 173.151 as follows:

An oxidizer is a substance such as chlorate, permanganate, inorganic peroxide, or a nitrate, that yields oxygen readily to stimulate the combustion of organic matter.

° Option 2: Adopt the DOT definitions of "flammable compressed gas", (49 CFR §173.300, "flammable liquid" (49 CFR §173.115), and "flammable solid" (49 CFR §173.150) which appear as follows:

a. "flammable gas", any compressed gas that is:

(1) Either a mixture of 13 percent or less (by volume) which with air forms a flammable mixture or for which the flammable range with air is wider than 12 percent regardless of the lower limit. These limits shall be determined at atmospheric temperature and pressure. The method of sampling and test procedure shall be acceptable to the Bureau of Explosives and approved by the Director, OHMT;

(2) Using the Bureau of Explosives' Flame Projection Apparatus a material for which the flame projects more than 18 inches beyond the ignition source with valve opended fully, or, the flame flashes back and burns at the valve with any degree of valve opening;

(3) Using the Bureau of Explosives' Open Drum Apparatus (see Note 1), a material for which there is any significant propagation of flame away from the ignition source;

(4) Using the Bureau of Explosives' Closed Drum Apparatus (see Note 1), a material for which there is any explosion of the vapor-air mixture in the drum.

A description of the Bureau of Explosives' Flame Projection Apparatus, Open Drum Apparatus, and Closed Drum Apparatus methods of testing may be procured from the Bureau of Explosives.

b. "flammable liquid", any liquid having a flash point below 100° F. (37.8°C.), with the following exceptions:

(1) Any liquid meeting one of the definitions specified in 49 CFR § 173.300;

(2) Any mixture having one component or more with a flash point of 100° F, (37.8°C.) or higher, that makes up at least 99 percent of the total of the mixture;

(3) A distilled spirit of 140 proof or lower is considered to have a flash point no lower than 73°F.

c. "flammable solid, any solid material, other than one classed as an explosive, which, under conditions normally incident to transportation is liable to cause fires through friction, retained heat from manufacturing or processing, or which can be ignited readily and when ignited burns so vigorously and persistently as to create a serious transportation hazard. Included in this class are spontaneously combustible and water-reactive materials".

° Option 3: Adopt a composite definition from both DOT and RCRA which would include the following:

a. The RCRA definition of non-liquids;

b. The DOT definition of flammable compressed gas;

c. The DOT definition of flammable solid; and

d. The RCRA definition of ignitable liquids which cover substances with a flash point of 140°F or less

° Option 4: Adopt a composite definition from both DOT and RCRA which would include the following:

a. The RCRA definition of non-liquids;

b. The DOT definition of flammable compressed gas;

c. The DOT definition of flammable solid; and

d. The DOT definition of flammable liquids which covers substances with a flash point of 100°F or less.

This option is identical to option 3 except that the definition of flammable liquids in d. is derived from DOT rather than RCRA. This definition is less stringent in that only substances with a flash point of 100°F or less would be designated to the Massachuestts Oil and Hazardous Materials List.

Recommendation: The proposed regulations use Option 3.

The Department's reasons for supporting this recommendation are four fold. First the Department believes that this option includes all flammable/ignitable materials, including liquids, non-liquids, solids and compressed gases, that can threaten public health, safety, welfare or the environment if released and for which the Department would want to receive notification.

Second, because this option adopts composite definitions from both RCRA and DOT the Department believes this option to be consistent with the intentions of §3 of M.G.L. c. 21E, which requires that the Department integrate implementation and enforcement of the chapter with all other programs established for the protection of public health, safety, welfare and the environment.

Third, the Department recognizes that the federal notification regulations provide a minimum level of protection to public health and public safety. The Department is committed to providing a level of protection that is at least as stringent as the federal regulation. The federal notification regulations specify reporting requirements for both "unlisted" hazardous waste and "unlisted" hazardous substances. Unlisted hazardous substances and wastes are those which exhibit any of the characteristics of hazardous wastes as defined in 40 CFR §261.22 - 261.24 and 310 CMR 30.120, but which are not specifically listed on either the RCRA list of hazardous wastes (40 CFR §261.33) or the CERCLA list of

hazardous substances (40 CFR §302.4). One of the characteristics of hazardous waste is ignitability, which covers liquids having a flash point of less than 140°F. For the purpose of regulatory consistency and to meet its commitment to be at least as stringent as the federal regulations, the Department has adopted the RCRA definition of flammable liquids (flash point of less than 140°), instead of DOT's, for screening substances according to the criterion of flammability/ignitability.

The final reason for proposing Option 3 is that it is a composite definition derived from regulations with which the regulated community is already familiar; this will support both compliance and implementability.

2.2.2.2 CORROSIVITY

This criterion is intended to identify those substances which may burn, irritate or destructively attack skin or corrode steel. If released to the environment these substances have the potential to cause a serious threat to public safety.

Options: The options for this criterion focus on whether the Department should utilize a composite definition for corrosivity adopted from the two primary agencies involved in regulating hazardous materials and wastes or whether one definition would sufficiently screen all materials likely to exhibit corrosivity. The Department considered the following options for defining the corrosivity criterion:

° Option 1: Adopt the RCRA definition of corrosivity (40 CFR §261.22):

a. an aqueous material that has a pH less than or equal to 2.0 or greater than or equal to 12.5; or

b. a liquid that corrodes steel at a rate greater than 6.35 mm (0.250 inch) per year at a test temperature of 55°C (130°F). Test described in NACE (National Association of Corrosion Engineers) Standard TM-01-69.

° Option 2: Adopt only the DOT definition (49 CFR §173.240) for corrosive material:

a. liquid or solid that causes visible destruction or irreversible alterations in human skin tissue at the site of contact. A material is considered to be destructive or to cause irreversible alteration in human skin tissue if, when tested on the intact skin of the albino rabbit, the structure of the tissue at the site of contact is destroyed or changed irreversibly after an exposure period of 4 hours or less; or

b. a liquid that has a corrosion rate in excess of 0.250 inch per year (IPY) on steel (SAE 1020) at a test temperature of 130°F.

° Option 3: Adopt a composite definition of the following RCRA and DOT definitions:

° an aqueous material that has a pH less than or equal to 2 or greater than or equal to 12.5;

° a liquid that corrodes steel at a rate greater than 6.35 mm (0.250 inch) per year at a test temperature of 55°c (130°F)

° a liquid or solid that causes visible destruction or irreversible alterations in human skin tissue at the site of contact.

Recommendation: The proposed regulations use Option 3.

The composite definition of corrosivity combines parameters of both physical and toxicological properties of concern and thus, allows for a more comprehensive

evaluation of candidate substances. In addition, the Department believes adopting a composite defintion of corrosivity from the two federal statutes currently regulating substances on the basis of this characteristic to be consistent with the intentions of c. 21E, §3 which requires the Department to integrate its regulation with those of other agencies established for the same purpose.

2.2.2.3 REACTIVITY

This criterion is intented to identify those substances which are unstable or which react violently with water. Releases of these substances to the environment are likely to cause a threat to public safety and may warrant special handling procedures.

Options: Options for this criterion focus on whether Class A and B explosives, as defined by the Department of Transportation (see 49 CFR §173.53 and 173.88), should be covered by the Department's definition of reactivity. The Department has considered the following options:

° Option 1: Adopt the RCRA definition of reactivity (40 CFR, §261.33):

a. Is normally unstable and readily undergoes violent changes without detonating; or

b. Reacts violently with water; or

c. Forms potentially explosive mixtures with water; or

d. Is a cyanide or sulfide which when exposed to a pH between 2 and 12.5 generates toxic gases; or

e. Is readily capable of detonation or explosive reaction when subjected to a strong initiating force or if heated under confinement; or

f. Is capable of detonation or explosive decomposition at standard temperature and pressure.

° Option 2: Add to the RCRA definition given in Option 1, the defini-

tions of Class A and B explosives from the DOT regulations (49 CFR §173.52):

a. Class A explosive - Detonating or otherwise of maximum hazard. (The nine types of Class A explosives are defined in 49 CFR 173.53.)

b. Class B explosive - In general, materials which function by rapid combustion rather than detonation and include some explosive devices such as special fireworks, flash powders, etc. (Seven types of Class B explosives are defined in 49 CFR 173.88).

2. Recommendation: The proposed regulations use Option 2.

The Department believes that adopting both the RCRA definition of reactivity and the DOT definitions of Class A and B explosives as the criteria for reactivity, includes more substances that may pose a threat to public safety if released, then would be provided by the use of the RCRA definition alone (NOTE: releases of class A and B explosives under military transport, to which the Army Ordinance Division responds, will not require notification of the Department.)

2.3 Use of Characteristics to Identify Hazardous Material

2.3.1 Characteristics of Ignitability, Corrosivity, Reactivity and Extraction Procedure Toxicity (ICRE)

Any substance which is not specifically listed on the Massachusetts Oil and Hazardous Materials List but which exhibits one or more of the characteristics of ignitability, corrosivity, or reactivity as defined in 310 CMR §40.324(a) through (c) will be regulated as a hazardous material subject to all of the provisions of (310 CMR 40.00) the Spill Notification Regulations. A material which is an unlisted hazardous waste prior to its release will be subject to 310 CMR 40.00 if it exhibits any of these characteristics or the characteristics of EP toxicity defined in 310 CMR §40.324(d). This approach is also used by EPA to identify unlisted hazardous material subject to the federal notification regulations (See 40 CFR §302.4).

2.3.2 DOT Labeling Categories

In addition to the use of the "ICRE" characteristics to identify unlisted hazardous material the Department has also considered using several of the hazard classes associated with the labeling requirements of DOT (49 CFR parts 100 to 177) to identify unlisted hazardous materials. The following hazard classes were evaluated:

- Explosive C
- Blasting Agents
- Non-Flammable Gas
- Poison Gas -
- Flammable Gas
- Flammable Liquid
- Flammable Solid
- Spontaneously Combustible
- Dangerous When Wet
- Oxidizer
- Organic Peroxide
- Poison
- Irritant
- Radioactive White - I
- Radioactive Yellow - II
- Radioactive Yellow - III
- Corrosive
- Etiologic Agent
- Magnetized Material
- Cargo Aircraft Only

An advantage of using the DOT hazard classes would be that since DOT regulations require that transported materials be labeled according to these hazard classes, identification of the material as a hazardous material would be facilitated.

A disadvantage, however, would be that many of the DOT hazard classes cover a wide range of materials from objects such as blasting caps, charcoal brikettes, and ammunition to mixtures as well as pure chemicals. Though the materials are easily identified by their labels, establishing one uniform RQ, appropriate for all materials in a particular class would be problematic. A case by case evaluation of each one of the hundreds of materials in each class would defeat the intended purpose of covering a wide range of materials without having to list or evaluate them individually.

Recommendation: The Department is proposing not to consider any of the DOT hazard classes associated with its labeling requirements as characteristics of unlisted hazardous material. Notification of hazardous material based simply on their DOT labelling requirements will not be required.

2.3.3 Infectious Material

In the definition of hazardous material which appears in c. 21E the Department is given the authority to regulate materials which exhibit infectious characteristics. The treatment and disposal of infectious materials is regulated by the Massachusetts Department of Public Health (MDPH) in its Hospital Licensure Regulations (105 CMR 130.360-130.362). These regulations define infectious waste as:

> Any waste that, because of its infectious characteristics may:
>
> (a) cause or significantly contribute to an increase in mortality or an increase in serious irreversible or incapacitating reversible illness; or
>
> (b) pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, disposed of, or otherwise managed.

The following are determined to be types of hazardous infectious waste or materials:

- cultures and stocks of infectious agents and associated biologicals
- blood and blood products
- pathological wastes
- contaminated sharps
- other wastes from surgery and autopsy
- contaminated laboratory wastes

The MDPH regulations do not require notification of releases of infectious wastes but do require that these materials be packaged and labeled in compliance with the hazardous materials regulations issued by both the Massachusetts Department of Public Works (720 CMR 8.00) and the federal Department of Transportation (48 CFR 173.386 through 173.388). Both DEQE and DPH currently receive notification and respond to releases of infectious materials though only DEQE has a contractor for cleaning-up a release of these materials if the responsible party will not.

Recommendation: The Department proposes requiring notification of a release of any material exhibiting any of the characteristics of infectious waste as specified in the MDPH definition.

3.0 DISCUSSION PAPER III - DETERMINATION OF REPORTABLE QUANTITIES FOR HAZARDOUS MATERIALS

3.1 Background

Once hazardous materials have been identified, a methodology is needed for assigning reportable quantities (RQs) to each of the designated materials on the basis of its relative hazards. In an effort to assess the adequacy of the federally established CERCLA reportable quantities for protecting public health safety, welfare, and the environment, the Department's Office of Research and Standards examined a number of spill scenarios involving various hazardous substances in amounts equal to the reportable quantities specified in the federal Notification Regulations. These assessments indicate that, in many cases, spills of an amount equal to the federally-established reportable quantities could have significant impacts on local resources, including surface water reservoirs and groundwater. On the basis of this analysis and the fact that the federal reportable quantities were established to trigger notification of federal response personnel of releases of a national scale, the Department has determined that it should establish reportable quantities lower than those used in federal regulations in order to protect the resources of the Commonwealth. This Discussion Paper describes a number of tiered approaches for classifying materials in order to assign reportable quantities. Options for assigning numerical reportable quantities, including the option of adopting the CERCLA reportable quantities, are also presented.

3.2 Methodologies for Classifying Materials

Options: The following options focus on the number of categories and the actual reportable quantities that should be used to reflect the relative hazard of substances on the Massachusetts Oil and Hazardous Materials List.

° Option 1: Adopt the EPA reportable quantity adjustment methodology for assigning RQs to substances listed on the Massachusetts Oil and Hazardous Materials List. The reportable quantity methodology was developed for the purpose of evaluating substances on the basis of several criteria and assigning RQs to substances on the CERCLA list of hazardous substances to reflect the relative hazard of these substances. It has the following features:

a. Substances are evaluated using each of the following primary criteria:

- aquatic toxicity (acute)
- mammalian toxicity (acute)
- chronic toxicity
- carcinogenicity
- ignitability
- reactivity

b. Evaluations include the classification of substances according to their relative hazard in terms of each criterion. For example, a substance may exhibit aquatic toxicity as well as reactivity. The LC_{50} of a substance will determine the hazard class in which it is placed on the basis of aquatic toxicity. The extent to which the substance is reactive will determine its hazard class for this criterion. Each hazard class is associated with a particular RQ. The criterion that results in the highest relative hazard classification will be used to determine the RQ for that substance. For example, if a substance is assigned an RQ of 100 pounds on the basis of the aquatic toxicity evaluation but is assigned an RQ of 10 pounds on the basis of its reactivity, the RQ for that substance will be the lowest of all the RQs which result from the evaluations, or 10 pounds.

c. In some cases, reportable quantities are adjusted as a result of an evaluation using secondary criteria including biodegradation, hydrolysis and photolysis (BHP), RQs are adjusted upward, e.g. from 10 pounds to 100 pounds, if the substance of concern is known to degrade to a less hazardous substance via any of these degradation processes.

The classification schemes for each of the primary criteria and the RQs associated with each category are presented in tables 3.1, through 3.6 on the following pages.

Table 3.1 - Acute Aquatic Toxicity[13]

RQ (pounds)	Aquatic toxicity	Category
1.....	LC_{50} <0.1 mg/liter.....	X
10.....	0.1mg/liter <LC_{50} 1mg/liter.....	A
100.....	1 mg/liter <LC_{50} <10 mg/liter.....	B
1000.....	10 mg/liter <LC_{50} <100 mg/liter.....	C
5000.....	100 mg/liter < LC_{50} <500 mg/liter.....	D

Table 3.2 - Acute Mammalian Toxicity[14]

RQ (pounds)	Mammalian toxicity (oral)	Mammalian toxicity (dermal)	Mammalian toxicity (inhalation)	Category
1.....	LD_{50}[15]<0.1mg/kg.....	LD_{50} <0.04mg/kg.....	LC_{50} <0.4 ppm	X
10.....	0.1mg/kg <LD_{50} <1mg/kg....	0.04mg/kg <LD_{50} <0.4mg/kg	0.4 pmm <LC_{50} <4 ppm	A
100.....	1mg/kg <LD_{50} <10mg/kg.....	0.4mg/kg <LD_{50} <4mg/kg...	4 ppm <LC_{50} <40 ppm	B
1000....	10mg/kg <LD_{50} <100mg/kg...	4mg/kg <LD_{50} <40mg/kg....	40 ppm <LC_{50} <400 ppm	C
5000....	100mg/kg <LD_{50} <500mg/kg..	40mg/kg <LD_{50} <200mg/kg..	400ppm <LC_{50} <2000ppm	D

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13. "LC_{50}" refers to that concentration of material which is lethal to one-half of the test population of aquatic animals upon continuous exposure for 96 hours. (See 40 CFR 116.14).

14. For a detailed explanation of the derivation of the categories used in the reactivity, ignitability and chronic toxicity criteria, see Technical Background Document to Support Rulemaking Pursuant to CERCLA Section 102.

15. "LD_{50}" refers to that dose of a substance expected to cause the death of 50 percent of a defined experimental mammalian population.

Table 3.3 - Chronic Toxicity[16]

RQ (pounds)	Composite score	Category
1	81-100	X
10	41-80	A
100	21-40	B
1000	6-20	C
5000	1-5	D

Table 3.4 - Carcinogenicity[17]

HAZARD RANKING			
Weight-of-evidence group	Potency group		
	1 (highest)	2	3
A	High	High	Medium
B	High	Medium	Low
C	Medium	Low	Low
D	No hazard ranking is made. The other primary criteria are used to assign the RQ.		
E	No hazard ranking is made. The other primary criteria are used to assign the RQ.		

16. Composite scores include parameter values for minimum effective dose (MED) and severity of effects. See section 2.2.2.2 for a detailed explanation of the composite scoring methodology.

17. For a detailed explanation of the derivation of the weight of evidence and potency classifications see The Final Guidelines for Carcinogen Risk Assessment published in the Federal Register on September 24, 1986 (see 51 FR 339920).

Table 3.5 - Ignitability

RQ (pounds)	Ignitability (fire)	Category
1.....	No 1-pound RQs on the basis of ignitability.	-
10.....	Pyrophoric or self-ignitable.	A
100.....	FP[18] <100°F, BP[19] <100°F.	B
1000.....	FP <100°F, BP >100°F.	C
5000.....	FP 100°-140°F	D

Table 3.6 - Reactivity[20]

RQ (pounds)	With water	Self-reaction	Category
1.....	No 1-pound RQs on the basis of reactivity.	No 1-pound RQs on the basis of reactivity	-
10.....	Inflames (e.g., Na, $CaCl_2$).	Extreme self-reaction; may cause explosion or detonation.	A
100.....	Extreme reaction (e.g., SO_3).	High; may polymerize; requires stabilizer.	B
1000.....	High reaction (e.g., oleum).	Moderate; contamination may cause polymerization; no inhibitor required	C
5000.....	Moderate reaction (e.g., NH_3).	Slight; may polymerize with low heat release.	D

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18. "FP" refers to the flash point, the temperature at which a substance forms an ignitable mixture with the air at the surface of the substance, measured using the closed cup test.

19. "BP" refers to the boiling point, the temperature at which a liquid boils.

20. Based on heat release.

° Option 2: Adopt the EPA methodology as described in Option 1 with the following modifications:

a. Substances would not be evaluated using any of the secondary criteria;

b. EPA's tiered methodology for carcinogens would not be used. Instead carcinogens would be evaluated using the Chemical Health Effects Methodology (CHEM) developed by the Department's Office of Research and Standards. All carcinogens classified as such would be assigned a uniform RQ (see section 2.2.2.3 for a more detailed discussion of both the EPA and DEQE carcinogen assessment schemes).

c. As described in 2.2.2.4 mutagens would be evaluated separately from carcinogens using the mutagen assessment methodology in CHEM. All mutagens would be assigned the same reportable quantity.

d. Due to the lack of quantitative and documented data, the EPA methodology for assigning reportable quantities on the basis of reactivity would not be used. Instead one uniform RQ would be assigned to all substances which exhibit any of the characteristics of reactivity as described in Sections 2.2.3.3.

e. All substances which exhibit any of the characteristics of corrosivity described in Section 2.2.3.2 would also be assigned one uniform RQ. EPA does not assign RQs on the basis of corrosivity.

f. The ignitability criteria would be modified so that for those flammable gases which are classified according to their upper and lower flammability limits rather than their flash point, one uniform reportable quantity would be assigned. All other flammable

materials would be assigned an RQ on the basis of the EPA RQ methodology.

° Option 3: Utilize a two or three RQ system where "extremely hazardous materials", (a criterion that would need to be defined) would be assigned a low RQ, a "moderately hazardous material" would be assigned a higher RQ, and all other substances would be assigned a even higher RQ.

This option was developed in response to the concern that the five tiered RQ system developed by EPA would present difficulties for the regulated community if there were only small incremental differences between the various reportable quantities. (The Department is proposing RQs of 1, 5, 10, 50 and 100 pounds.) The argument was that a smaller number of categories would be simpler and easier to understand.

° Option 4: Do not categorize hazardous materials on the basis of their relative hazard but assign all hazardous materials on the Massachusetts Oil and Hazardous Materials List the same RQ.

Recommendations: The proposed regulations use Option 2

The Department believes the EPA's RQ Adjustment Methodology represents a fundamentally sound strategy which considers the physical, chemical and toxicological properties of hazardous substances. The process of evaluating each substance on the basis of all six criteria and then assigning the lowest RQ which results from these assessments assures that a substance will be regulated on the basis of its most hazardous characteristics and that RQs will be consistent with the relative hazard of the substance.

The Department believes that assigning one reportable quantity to all designated materials or assigning only two or three reportable quantities would fail to accomodate the range of toxicities and physical properties exhibited by the designated materials. A five tiered system of assigning reportable quantities would not be more complicated in that there would be only one reportable quantity for each hazardous material.

The Department's rationale for modifying the EPA methodlogy is based on both the lack of data available to assign reportable quantities using this methodology and the need to assign reportable quantities to substances which are not encompassed by the EPA methodology. For example, a number of data bases which report on the physical and chemical properties of a variety of substances were reviewed in an effort to obtain data on the basis of reactivity using the EPA methodology. (See Discussion Paper for section 40.600 - Developing the Massachusetts Oil and Hazardous Materials List). Because the classifications used in the EPA methodology are defined in qualitative rather than quantitative terms (i,e, extreme, high and moderate reactions), and because the data on the physical properties of substances is not typically reported in this way, the methodology was not applicable to assigning reportable quantities to substances proposed for inclusion on the Massachusetts Oil and Hazardous Materials List on the basis of reactivity. The Department is therefore proposing to assign one reportable quantity to all substances proposed for listing on the basis of reactivity. In addition, because the EPA methodology does not evaluate substances on the basis of corrosivity and the Department is proposing to list hazardous materials on the basis of corrosivity, it will also assign one reportable quantity to all substances proposed for listing on the basis of this criterion.

With regard to assigning reportable quantities on the basis of flammability, the only data available to the Department for flammable gases were on their upper and lower flammability limits. Because the EPA methodology classifies flammable substances using flash point and boiling point rather than the upper and lower flammability limits, flammable gases could not be classified according to the EPA methodology. The Department is again proposing one reportable quantity for all substances that are listed on Massachusetts Oil and Hazardous Materials List on the basis that they are flammable gases.

With regard to the classification of suspected carcinogens, the Department believes that all substances for which there is some evidence of carcinogenicity should be subject to the notification requirements in the event of a releases. As described in section 2.1.3 the Department is proposing to apply the carcinogen assessment methodology developed in CHEM to evaluate carcinogens and believes that, with regard to potential carcinogens, it is inappropriate to assign different RQs on the basis of qualitative evidence of carcinogenicity. For this reason the Department is proposing to assign all substances screened as potential carcinogens one conservative RQ.

In addition, because the Department is proposing to evaluate and list mutagens that are classified as such using the Chemical Health Effects Methodology (CHEM) developed by the Department's Office of Research and Standards, it is also proposing to assign one reportable quantity to all mutagens in the Massachusetts Oil and Hazardous Materials List.

Finally, with regard to applying the secondary criteria, the Department believes the proposed reportable quantitatives adequately protect of public health, safety, welfare and the environment. For this reason the benefits obtained by evaluating substances using the secondary criteria would be marginal and in many case so low as to be impractical.

3.3 Assigning Reportable Quantities

In addition to proposing a methodology for assigning reportable quantities, the Department is also proposing reportable quantities to accompany the methodology. Consistent with the proposal to classify substances according to the relative hazard and to assign reportable quantities on the basis of the five-tiered classification system, the following options focus on the adequacy of a given set of reportable quantities to protect the resources of the commonwealth.

Option 1: Adopt the reportable quantities used by EPA in their methodology to adjust RQs. These RQs are as follows:

Category	EPA RQs (lbs)
X	1
A	10
B	100
C	1000
D	5000

Substances classified in categories X-D would be assigned their respective reportable quantity.

° Option: Lower the RQs associated with each category in the EPA methodology and adjust the RQs of each substance on the CERCLA list as follows:

Category	EPA RQs (lbs)	Option 2a (lbs)	Option 2b (lbs)
X	1	1	1
A	10	5	5
B	100	10	10
C	1000	50	50
D	5000	100	500

The highest RQ in Option 2b (500 pounds) is based on an assumption of commonly used shipping containers. It was suggested that a barrel of materials weighed roughly 500 pounds and that this quantity would be easily identified if released.

Recommendation: The Department believes the reportable quantities associated with the EPA methodology would not adequately protect the resources of the Commonwealth and has, therefore, proposed to lower these RQs. With regard to using either 100 or 500 pound as the highest RQ, the Department supports the more conservative option of assigning 100 pounds as the highest RQ category. The Department believes it is inconsistent to establish one RQ class on the basis of shipping container size when all other classes have been established on the basis of toxicity or other safety considerations. The Department acknowledges that there is a certain degree of arbitrariness in attempting to quantify the relative risk of a substance by assigning reportable quantities. The selection of the reportable quantities presented in the proposed option are based on considerations of public health and safety as well as compliance and enforceability.

The Department further acknowledges that any reportable quantity will result in the reporting of some releases that are not harmful, just as some harmful releases may go unreported. The Department believes the proposed reportable quantities minimize this to the extent possible

3.4 Other Reportable Quantities - Mixtures

When determining if notification is required for releases of mixtures and solutions containing hazardous materials the Department proposes to apply the mixture rule contained in the federal regulations implementing section 311 of the Clean Water Act. This rule provides that "discharges of mixtures and solutions are subject to these regulations only where a component hazardous substance of the mixture or solution is discharged in a quantity equal to or greater than its reportable quantity (44 FR 50767, August 29, 1979). Reportable quantities of different materials will not be additive under the mixture rule so that spilling a mixture containing half an RQ of one hazardous material and half an RQ of another hazardous material will not require a report. In addition, the

Department is proposing to require that, if the concentrations of the constituents of a mixture are not known the reportable quantity for the entire mixture shall be 10 pounds or the reportable quantity for the constituent which is a hazardous material, whichever is lower.

3.5 Air Releases

The Department is proposing to require notification of a release of hazardous material to the air from an outfall, stack or other point source, or as fugitive emission that is covered by a permit, license, approval, order or guideline issued under a federal or state statute or regulation only when the release exceeds the permitted amount or amount allowed by regulation and it presents an imminent hazard. The Department is also proposing to require notification of an unpermitted or unregulated air release when the quantity of that release can be determined and is known to be equal to or to exceed the reportable quantity for that hazardous material or when the release can not be quantified. The Department invites comments on all aspects of this issue especially with regard to whether any incongruous circumstances could result.

4.0 DISCUSSION PAPER IV - DEFINITION OF OIL AND DETERMINATION OF REPORTABLE QUANTITIES

4.1 Background

Oil has been evaluated and discussed separately from hazardous materials throughout the regulatory development process described in this document. The reason for considering oil separately from hazardous material is that the statutory definition of hazardous material specifies that the term shall not include oil and that sections 5 and 6 of M.G.L. c. 21E, (which pertain to liability for releases or threats of release of oil and hazardous material and the prevention or control of releases of hazardous materials) clearly establish different requirements for oil and hazardous materials.[21]

The following issues, pertaining to the requirement for notification of releases or threats of release of oil, were addressed by a technical workgroup consisting of members from the Superfund Advisory Committee:

(1) classifications of petroleum and non-petroleum based oil on the Massachusetts Oil and Hazardous Materials List;

(2) establishing reportable quantities for petroleum based oils, non-petroleum based oils synthetic oils and waste oil; and

(3) exemptions from reporting for petroleum based oil.

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21. The federal notification regulations promulgated under the authority of CERCLA exempt releases of oil from reporting requirements. The proposed regulations governing underground storage tanks (See FR, Vol. 52, No. 74, 4/17/87) require notification in the event of a spill or overfill of petroleum based oil that either exceeds 25 gallons or creates a sheen on surface water. In addition a notification is required if testing, sampling or monitoring results from a specified detection method indicate that a release may have occurred.

This Discussion Paper describes the options that were considered to address each issue. The Department's recommendations and the associated rationales are also presented.

4.2 Classification of Oils

Options: The following options for classifying oils on the Massachusetts Oil and Hazardous Materials List were evaluated:

° Option 1: List "oil" and "waste oil" on the Massachusetts Oil and Hazardous Materials List.

° Option 2: List "petroleum-based oil", "non-petroleum based oil", "synthetic oil" "PCB-contaminated oil" and "waste oil" separately;

° Option 3: List "petroleum-based oils", "synthetic oil", "PCB-contaminated oil" and "waste oil" separately and subdivide "non-petroleum based oil" into separate listings for "animal oil" and "vegetable oil".

° Option 4: List "non-petroleum oil", "synthetic oil", "PCB-contaminated oil", and waste oil separately and also subdivide the various types of petroleum based oils. The options for classifying "petroleum based oil" can be listed by general groups such as:

(a) heavy, middle and low end distillates; or

(b) specific products:

° Gasoline (noted as leaded or unleaded, if known)

° Aviation gas

° Jet fuel

° Kerosene

- ° Diesel fuel oil
- ° No. 2 fuel oil
- ° No. 4 fuel oil
- ° No. 5 fuel oil
- ° No. 6 fuel oil

- ° Lubricating oil (including motor oil, machine oil, cutting oil and grease)

- ° Transmission oil

- ° Thermal oil (including heat transfer/exchange oil and insulating oil)

- ° Hydraulic oil

- ° Transformer oil (including capacitor oil and mineral oil)

Recommendations: The proposed regulations use Option 3.

The Department proposes to list types of oil separately if (1) based on a comparison of the toxicities of the different types of oils, different reportable quantities (RQs) are required to reflect differences in their relative toxicities; or (2) clarity is significantly enhanced. Non-petroleum based oils (i.e. animal and vegetable oils) are believed to be significantly less toxic than petroleum based-oils and their proposed RQ reflects their relative lower toxicity. The Department also determined that waste oil is more toxic than other types of oils based on the variety of hazardous constituents it contains and that therefore, the RQ for waste oil should be lower than the RQ assigned to other types of oil. (See FR. Vol. 50, 230 Friday, November 29, 1985, pp. 49265 - 49267). Because petroleum based oil, animal and vegetable oil, and waste oil have different toxicities the Department is proposing different reportable quantities to reflect these different toxicities and, therefore, these oils will be listed separately.

Though synthetic oils will have the same RQ as petroleum based oils, some synthetics are not considered petroleum based. To make it clear that the Department is requiring notification of releases or threats of release of all

synthetic oils it is proposing to also list synthetic oils separately on the Massachusetts Oil and Hazardous Materials List.

The RQs for PCB-Contaminated Oil are consistent with federal regulations promulgated under the authority of the Toxic Substances Control Act. These oils have been listed separately in order to reflect their different RQs.

Issues for Comments: The Department wishes to focus attention on the following issues:

° Do the relative toxicities of petroleum based oils (e.g. gasoline, kerosene, #2, 4, 6 fuel oils) warrant different RQs and therefore separate listing on the Massachusetts Oil and Hazardus Materials?

° Are there any oils not covered by the five designations to the Massachusetts Oil and Hazardous Materials List?

4.3 Exemptions

Background

In establishing reportable quantities for the six classifications of oil - petroleum based oil, synthetic oil, animal oil, vegetable oil, waste oil and PCB-contaminated oil - the Department sought a level of protection that was conservative and also practical. The Department recognized that it could achieve the same results by establishing higher reportable quantities which would be less inclusive or by specifying exemptions. The Department considered the following issues in recommending both reportable quantities for all six classifications of oil as well as for exemptions from the requirement to notify:

(1) the variety of situations in which releases occur and when releases actually reach the environment;

(2) the public health, safety, welfare and environmental impacts of releases of petroleum-based and non-petroleum-based oils;

(3) the frequency of these releases; and

(4) the ability of the regulated community to handle these releases in a manner that does not threaten public health, safety, welfare and the environment.

The next section describes the options considered by the Department for establishing an adequate level of protection using reportable quantities and exemptions.

Options: In evaluating the options that represent different combinations of reportable quantities and exemptions with which to establish an appropriate level of protection, the Department considered the following settings in which releases occur:

a. unenclosed/uncontrolled - e.g. home heating oil deliveries, overfilling on loads drops at gas stations, ruptures of tanks holding transformer oil on utility poles, traffic accidents causing releases of gasoline;

b. partially enclosed/controlled - releases from loading racks or tanks which are captured by berms, dikes, lined trenches, or oil-water separators;

c. enclosed/controlled - releases from the primary tank in a double walled tank or releases from the primary wall when the facility is equipped with double walled piping.

° Option 1: Set a reportable quantity for each of the six types of oil which provides protection given the worst-case scenario, i.e., a release into an environmentally sensitive area. This reportable quantity would apply to all situations and there would be no exemptions;

° Option 2: set a reportable quantity for each of the six types of oil which provides protection given the worst-case scenario while granting exemptions from notification for one or more of the following release situations:

a. Releases that occur during home heating oil deliveries (unenclosed/uncontrolled release). It has been argued that the frequency of these releases would inundate the Department with notifications.

b. Releases resulting from tank ruptures during passenger vehicle accidents (unenclosed/uncontrolled release). Two reasons were cited for exempting releases which result from passenger vehicle accidents from the requirements of notification. These reasons include:

   ° the unliklihood of receiving notification of a release of this type from the operator of a vehicle (technically the responsible party) who may be injured or otherwise preoccupied with details of the accident; and

c. Releases that are captured and contained and within the design capacity of properly functioning oil water separators (partially enclosed/controlled release). The Oil Workgroup heard reports from three oil terminal representatives who described the frequency and magnitude of releases at loading racks at their facilities and their spill control capabilities.

Releases at loading racks were reported to occur an average of ten times per day and range in size from one quart to one hundred gallons each. These releases are considered by the industry to be a routine part of operations. These releases are captured by a dike or berm and are then routed to the facility's oil water separator which discharges the water under the terms of a National Pollutant Discharge Elimination System (NPDES) Permit. Releases to the oil water separator in excess of its design capacity would be reportable. In addition, releases from the oil water separator in excess of permitted discharge limits would also require notification.

d. Releases from primary tanks that are captured by secondary tanks and releases that are captured by double walled piping (enclosed/controlled releases).

e. Releases that are captured in bermed or diked areas that are not routed to oil water separators.

° Option 3: Set one reportable quantity which provides protection given the worst case scenario and a higher reportable quantity for facilities that contain or capture these releases. In other words the releases described in (c) through (d) in option (2) (releases to oil water separators and releases from primary tanks that are captured by secondary tanks) would be subject to a higher reportable quantity. There would be no exemptions from reporting.

Recommendation: The proposed regulations use Option 2 with exemptions b,c, and d. This option sets forth one RQ which is protective in the event of the worst case scenarios and grants exemptions from notification for (1) releases that result from tank ruptures during passenger vehicle accidents; (2) facilities which capture and contain releases using properly functioning oil/water separators; and (3) releases from primary tanks that are captured by secondary tanks and releases that are captured in double walled piping.

In granting an exemption from notification requirements to releases resulting from tank ruptures during car accidents, the Department recognizes both the unlikelihood of receiving notification of a release from the operator of a vehicle who is legally the "responsible party".

Releases from loading racks at oil terminals were reported to occcur an average of 10 times per day. Because these releases are typically captured and contained by oil water separators, and because the only release is to the air between the time the oil is released and when it flows into the oil-water separator, the Department believes that exemping these releases from notification requirements is practical without compromising environmental protection. Any releases in excess of the design capacity of the oil water separator would be reportable.

The Department does not believe releases from home heating oil deliveries should be exempt from reporting requirements, since experience is that these are frequently not cleaned up and often exceed 15-20 gallons.

The Board of Fire Prevention Regulations developed by the Department of Public Safety require that the DEQE be notified of a leak from an underground storage tank whether determined by tank testing or otherwise. (See 527 CMR §9.19). The regulations do not specify whether all leaks, including leaks from the primary tank of a double walled tank that are captured in the interstitial space are encompassed by the definition of leak. Because the Department is concerned only with releases or threats of release to the environment, the proposed Spill Notification Regulations do not require notification of a release of petroleum based oil from the primary tank of a double walled tank that is captured in the tank's interstitial space unless the external wall does not have the same structural integrity as the internal wall due to its thickness or some other design feature. In this case or in the event of corrosion or other damage to the external wall, notification to the Department is required. The Department will suggest regulatory language to be incorporated in the Board of Fire Prevention regulations in order to clarify this issue and make the two sets of regulations compatible.

Finally, the Department does not believe releases that are captured by berms or diked areas should be exempted from notification. The design of these structures often lack consistency in design and reliability and, because they are often constructed out of soil and other earthen materials, releases would constitute both exposure to air and to soil. Repeated releases could result in percolation to underlying strata including groundwater.

Issues for Comment

- Should releases that are captured and contained by properly functioning oil/water separators be exempted from reporting requirements?

- Should any other exemptions be considered?

4.4 Reportable Quantities

4.4.1 Petroleum Based Oil

Options: The Department considered the following reportable quantities for petroleum based oil:

° Option 1: 5 gallons on the basis that releases of this quantity in a highly sensitive area have had environmental impacts.

° Option 2: 10 gallons on the basis that, in the majority of cases, this reportable quantity adequately protects public health and safety and was also practical.

° Option 3: 15 gallons on the basis that this reportable quantity would serve to exclude a majority of spills resulting from home heating oil deliveries.

° Option 4: 20-25 gallons on the basis that this reportable quantity would serve to exclude tanks ruptures from passenger vehicle accidents.

Recommendation: The proposed regulations use Option 2.

The Department believes a reportable quantity of 10 gallons for petroleum-based oil protects public health, safety, welfare and the environment without being impractically conservative. The department acknowledges that no reportable quantity can reflect the myriad of actual circumstances that may occur and recommends that if a release of petroleum in an amount less than the reportable quantity occurs in an environmentally sensitive area e.g., directly into drinking water supplies, the Department should be notified.

With respect to establishing a reportable quantity high enough to effectively exempt releases from either tank ruptures that result from passenger vehicle accidents or home heating oil delieveries, the Department believes that this would exclude a number of releases of which it would want to be notified.

Issues for Comment

° Do the relative toxicities and potential environmental impacts of the various petroleum based oils warrant establishment of different RQs or an RQ lower than 10 gallons?

4.4.2 **Animal and Vegetable Oils**

Options: The Department has considered the following reportable quantities for animal and vegetable oils:

° Option 1: 10 gallons or the same as petroleum based oil

° Option 2: 55 gallons

Recommendations: The proposed regulations use Option 2.

The choice of a 55 gallon RQ is based on the low toxicity of animal and vegetable oils and on the fact that such oils are typically shipped in 55 gallon drums.

Issues for Comments:

° Do public safety considerations warrant a lower RQ for animal and vegetable oil?

° Are any other data available regarding the toxicity of animal and vegetable oils that support a different RQ?

4.4.3 Synthetic Oils

The Department is proposing a 10 gallon reportable quantity for synthetic oil. As explained in section 4.2, synthetic oils are listed separately on the Massachusetts Oil and Hazardous Materials List, not because the Department is proposing that they be assigned a unique reportable quantity but, in order that, the regulated community be able to recognize that they are an oil for which notification is required in the event of a release or threat of release. The Department believes a reportable quantity of 10 gallons is both practical and protective of public health, safety welfare and the environment.

4.4.4 Waste oil

Options: The Department considered the following reportable quantities for waste oil:

° Option 1: 5 gallons, based on the origins and relative toxicity of waste oils;

° Option 2: 10 gallons (or the same as the recommended reportable quantity for other petroleum based oils) to avoid confusion to the regulated community.

Recommendations: The proposed regulations use Option 1.

In a study of the composition of waste oils sponsored by EPA it was determined that a number of toxic constituents are typically present in waste oil in greater concentrations than in virgin oil. These concentrations are sufficient to cause substantial harm. These constituents known to have carcinogenic, mutagenic, teratogenic or other chronic or acutely toxic properties include lead, trichloroethylene, tetrachloroethylene, napthalene, toluene and 1,1,1 trichloroethane. (See FR Vol 50, No 230, Friday, November 29, 1985 9267).

As described in section 1.2.4, the Department is proposing to use a composite of the definitions of used waste oil and used wasted oil to define waste oil. Because the oils encompassed by the definition of unused waste oil are more like oils than waste oils, the Department is proposing a 10 gallon reportable quantity for unused waste oils. The proposed reportable quantity for used waste oils will be 5 gallons based on the constituents of these oils and their greater relative hazard. However, with regard to establishing two different RQs for oil and waste oil the Department is requesting comment on the following:

Issues for Comment

° What problems could arise by establishing different RQs for waste oil and other petroleum based oil and for unused waste oil and used waste oil? Would these problems outweigh any added environmental protection?

4.4.4 PCB Contaminated Oil

Consistent with the PCB Spill Cleanup policy rule (see FR. Vol. 52, No. 63, 4/2/87 issued by EPA) the Department is proposing to require notification of a release of PCB contaminated oil in an amount equal to or in excess of 1 gallon if the PCB's are present in concentrations greater than 50ppm. If the concentration of PCB's is less than 50ppm, the reportable quantities shall be 10 gallons, or equivalent to that of other petroleum-based oil.

5.0 DISCUSSION PAPER V - NOTIFICATION PROCEDURES

5.1 Notification Requirements - Who Notifies

Chapter 21E requires that any owner or operator of a site or vessel must immediately notify the Department of a release or threat of release of oil or hazardous material. Though the Department currently receives a number of notifications from parties other than the responsible owner or operators, (e.g., fire departments, state police, boards of public health) the ultimate responsibility for assuring that the Department is notified of a release or threat of release of oil or hazardous material remains with the owner or operator (or other parties described in c. 21E §5(a)) of the site or vessel from which the release or threat of release originates.

5.2 When to Notify

Notification of the Department in the event of a release or threat of release should occur as soon as the owner or operator of the site or vessel has knowledge of the event. Presently, a release or threat of release of any amount of oil or hazardous material requires notification. The proposed Spill Notification Regulations establish reportable quantities for each listed oil or hazardous material as well as hazardous materials that are not listed on the Massachusetts Oil and Hazardous Materials List but which exhibit one or more of the characteristics of hazardous materials described in section 40.323 of the proposed regulation. Notification is required if the release exceeds the reportable quantity for that oil or hazardous material or if the threat of release has the potential to exceed the reportable quantity. If the release is to an environmentally sensitive area where it directly and immediately threatens public health, safety, welfare or the environment, a release of any amount requires notification.

For notification purposes, the Department will consider the entire contiguous plant or installation and contiguous grounds under common owenership to be the reporting site or vessel rather than each vent, pipe, or piece of equipment at such a plant. Consistent with the federal notification regulations promulgated under CERCLA, all concurrent releases of the same substance from a particular site or vessel into the environment must be aggregated to determine if the reportable quantity has been exceeded.

Releases of infectious waste, as defined in section 2.3.3 will also require notification. Releases of radioactive material, including any of the radionuclides specified in either 40 CFR §302.4, in excess of their respective reportable quantities, or 120 CMR 120.015 in excess of their respective "exempt quantities" require notification of the National Response Center and/or the Massachusetts Department of Public Health, but not the Department.

5.3 How to Notify

The Department is establishing a 24-hour phone number for notification of spills. Until this system is operable, calls during business hours must be made to the appropriate DEQE regional office. After business hours, which includes nights, weekends, and holidays, calls are made to the State Police public safety number.

5.4. Content of Notification

Options: The Department considered the following options in specifying the points of information that must be reported by the responsible party to the Department:

° Option 1:

a. the name and telephone number of the caller.

b. where the release occurred.

c. the date and time the release occurred.

d. the name(s) of the oil or hazardous material(s) released.

e. the quantity of the oil or hazardous material released or of which there is a threat of release.

f. the source of the release.

g. a brief description of the incident.

h. the name and telephone number of the owner/operator of the site or vessel at the time the release occurred.

i. measures taken or proposed to be taken in response to the release as of the time of the notification.

j. environmental resources affected or potentially affected.

k. any other information which, in the judgement of the person reporting the information should be reported to the Department.

° Option 2: Same as one above except item (k) is modified as follows:

(k) any other information which, in the judgement of the Department, should be reported.

Recommendation: The proposed regulations use Option 1.

The Department believes the information specified in item (a) through (k) will provide the Emergency Response Coordinator with the information needed to make a decision regarding the appropriate response. Item (k) in the proposed option serves to clarify that the owner or operator's responsibility in reporting a release is to relay all information believed to be pertinent to making an accurate response decision.

5.3 Follow-up Written Notifications

Follow-up written notifications, submitted subsequent to notification by telephone, will be required on a case-by-case basis when the circumstances of a case indicate that it is necessary.

5.4 Confidentiality

Concern has been raised regarding the treatment of proprietory information reported during an initial notification or follow-up. Department regulations specify procedures to be followed by parties requesting that submitted information be treated as a trade secret and criteria to be used by the Department for determining whether a record qualifies as confidential. (See Access to and Confidentiality of Department Records and Files in 310 CMR 3.00). Any company interested in obtaining confidentiality for information submitted in fulfillment of the notification requirements should follow the procedures established in those regulations. With regard to confidential information submitted over the telephone, the Department will honor an oral request for confidentiality, but must receive a written request consistent with the requirements of 310 CMR 3.0 by the end of two business days.

5.5 Proof of Notification

The Department will provide proof of notification by assigning a case tracking number to the person reporting the spill.

6.0 DISCUSSION PAPER VI - DEVELOPING THE MASSACHUSETTS REPORTABLE QUANTITIES LIST

6.1 Source Lists

While acknowledging that these lists do not include all substances of concern to Massachusetts, the Department has decided to use the CERCLA List of Hazardous Substances and the List of Extremely Hazardous Substances associated with various reporting requirements under Title III of the Superfund Amendments and Reauthorization Act of 1986 as a baseline for developing the Massachusetts Oil and Hazardous Materials List. Six additional lists of hazardous substances have been cross referenced with the CERCLA list. Substances unique to each of the six additional lists, (i.e substances that do not appear on the CERCLA or Extremely Hazardous Substance List), were evaluated to determine whether they should be added to the Massachusetts Oil and Hazardous Materials List. Figure 6-1 describes the origin of these candidate substances. A brief descriptions of the source lists for the Massachusetts Oil and Hazardous Materials List follow.

The Massachusetts Substance List (MSL)

This list was developed by the Massachusetts Department of Public Health under the authority of the Right-to-Know Law (105 CMR 670.000). The purpose of the Massachusetts Substance List is to identify toxic or hazardous substances for which "valid scientific evidence exists that exposure to the substance may result in an acute or chronic risk to human health or safety." Criteria for adding substances to the Massachusetts Substance List are designed to screen substances which represent acute or chronic risk to human health and safety, and include carcinogens, mutagens, teratogens, and neurotoxins. Because the purpose of the Massachusetts Substance List is to identify substances which represent a risk to public health and safety, the Department has evaluated all of the substances on the Massachusetts Substance list for possible designation to the Massachusetts Oil and Hazardous Materials List. Referring to Table 6-1, 1591 substances appear on the Massachusetts Substance list.

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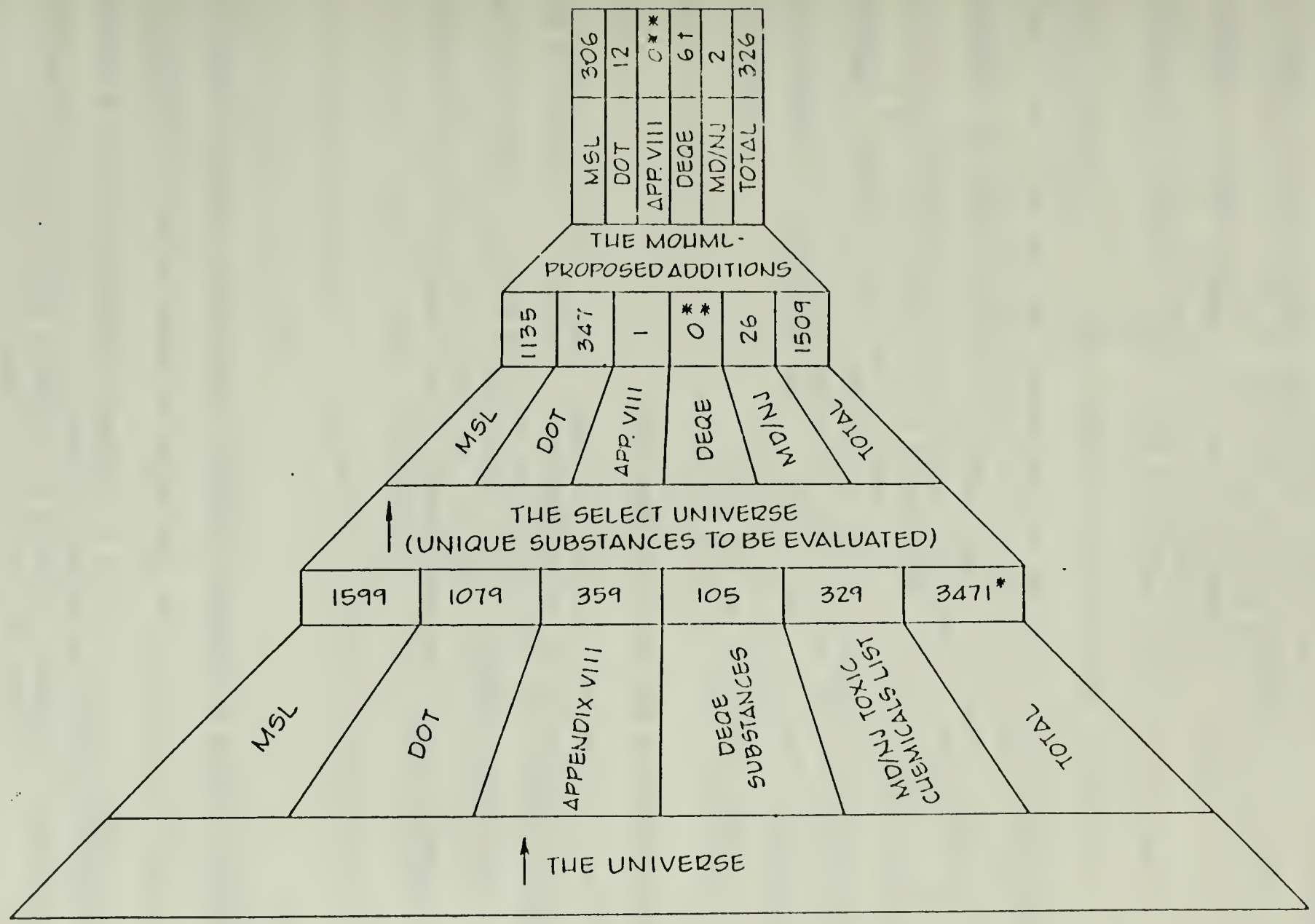

* Many substances are common to multiple lists. This number is a "false" total.
** Zeros may indicate that substances may have been "claimed" by previous lists See Table 3-1.
† These six substances were not evaluated but were proposed for appending to the MOHML to cover the different reportable oils

Figure 6-1 The Breakdown of the Universe, Candidate Substances to be Evaluated, and the Proposed Additions to the MOHML

The Department of Transportation List of Hazardous Materials.

The Hazardous Materials Transportation Act authorizes the Department of Transportation (DOT) to establish regulations governing the safe transportation of hazardous materials in commerce. The DOT List of Hazardous Materials was developed for this purpose. In developing the List several hazard classes were used as criteria for listing hazardous materials, including ignitability flammability, corrosivity, explosivity, etiologic agent, etc. The DOT criteria are largely consistent with those of the Department in that both are intended to protect public safety. Therefore, many substances which appear on the DOT list would likely be of concern to the Department and for which they would want to receive notification if released to the environment. The DOT list contains a number of substances, mixtures, and objects. The Department is restricting evaluations to the 1079 substances on the list.

The New Jersey/Maryland List of Toxic Chemicals

The New Jersey/Maryland List of Toxic Chemicals is also being evaluated by the Department. This list, composed of 311 substances, is associated with a number of hazardous chemical reporting requirements also promulgated under Title III of SARA.

Appendix VIII

The 367 chemicals listed in Appendix VIII of the Hazardous Waste Regulations, promulgated under the authority of the Resource Conservation and Recovery Act, are used by the Administrator of EPA to determine whether to list a hazardous waste. In addition, treatment, storage or disposal facilities must monitor groundwater for these constituents.

DEQE Substances

The Department has established ambient air and drinking water standards and/or guidelines for 105 substances. These substances will all be subject to the Notification Requirements specified in 310 CMR 40.500.

6.2 Data Acquisition

The Department worked with a contractor to evaluate a number of sources of data which contain information on the physical and chemical properties of a variety of substances including those which appear on the source lists described in the previous section. A substance would be included on the Massachusetts Oil and Hazardous Materials List if one or more of the parameter or threshold values which define the public health and public safety criteria were met for that candidate substance. The data search was initiated by using the substances Chemical Abstract Service (CAS) number. The data sources were evaluated on the basis of the number of data entries they contained, the extent to which the data entries were documented, and the accessibility/readability of the data sources. Out of ten data bases evaluated, the following three were found to contain the greatest number of data entries for the parameters of concern and were also the most accessible:

- Hazardous Substances Data Bank (HSDB); responsible agency: Oakridge National Laboratory

- Registry of Toxic Effect of Chemical Substances (RTECS): responsible agency: National institute of Occupational Safety and Health

- Hazardline: responsible agency: Occupational Health Services, Inc. Following their evaluation substances found to exhibit any of the characteristics defined in any of the evaluation criteria will be automatically listed on the MRSL.

In some cases CAS numbers were not available with which to initiate the data search. In addition quantitative data on reactivity, flammability and corrosivity, the Department's public safety criteria, was scarce and largely undocumented. Further information on data acquisition and other aspects of developing the Massachusetts Oil and Hazardous Materials List are available in the Technical Support Documents prepared by the Department's contractor.

6.3 The Massachusetts Reportable Quantities List

All hazardous materials and oils for which notification is required in the event of a release or threat of release will be listed on the Massachusetts Oil and hazardous Material list. The reportable quantities that trigger notification will also appear on the list. The list will be keyed both alphabetically and by CAS number and have the following features:

- A list of hazardous materials reportable oils;
- DEQE Reportable Quantities
- Synonyms for listed hazardous materials; and
- CERCLA Reportable Quantities

	DEQE	CERCLA	TITLE III
4. Procedures			
° Who to call/when	° In the event of a release of oil or hazardous material in an amount equal to or in excess of its RQ, in any one week period, or in the event of a threat of release, immediate notification of DEQE is required. After business hours notify the appropriate DEQE regional office. The DEQE via the state police emergency number. One 24 hour 800 number will be established by 1/88 to receive c. 21E and Title III notifications.	° Immediate notification of the National Response Center is required in the event of a release of a hazardous substance in excess of its RQ in any 24 hour period.	° Immediate notification in the event of a release must be made to the state and local emergency response commissions. DEQE will receive emergency notifications for the state commission.
° Period of release	° One week period of release	° 24 hour period of release	° No period of release specified
° Threat of release	° Notification required if threat of release exists	° Statute covers threats of release but regulations do not.	° No requirement for reporting a threat of release
° Follow-up written	° required only when circumstances of a case indicate that it is necessary	° Follow-up written not required	° Follow-up written notification required as pratical after release. Notifications are in addition to, not in replacement of notifications required under CERCLA

	DEQE	CERCLA	TITLE III
° Quantities			
° Listed hazardous materials	° A 5 tiered system will be used to assign RQs based on the relative hazard of the hazardous material; RQs of 1,5 10,50 100 lbs. will be assinged. Oils PCB contaminated oil if >50 ppm — 1 gal. PCB contaminated oil if <50 ppm — 10 gal. petroleum based oil — 10 gal. unused waste oil — 10 gal. used waste oil — 5 gal. synthetic oil — 10 gal. animal/vegetable oil — 55 gal.	° 5 tiered system based on relative hazard of the hazardous material; 1,10,100,1000, 5000 lbs. have been assigned oils not covered	° The RQ for any CERCLA substance is that which appears on Table 302.4 for that substance. The RQ for any other substance (i.e. substances that are on the 405 list but are not also on the oils not covered CERCLA list) is one pound.
° Unlisted Hazardous Materials	° 10 lbs	100 lbs	NA
° Radionuclides	° Radionuclides exempt from regulations	° Given in curies for 757 radionuclides	NA
Mixtures	° When the concentration of a component hazardous material of a mixture or solution is known, a release of the mixture or solution is subject to state notification regulations when the quantity of the component hazardous material released equals or exceeds the reportable quantity for that component hazardous material. If the concentration of the component hazardous material is not known, the reportable quantity is 10 lbs.	° When the concentration of a component hazardous material of a mixture or solution is known, a release of the mixture or solution is subject to state notification regulations when the quantity of the component hazardous material released equals or exceeds the reportable quantity for that component hazardous material. If the concentration of the component hazardous material is not known the reportable quantity is 100 lbs.	° The concentration of a hazardous substance in a mixture or solution should be multiplied by the mass in pounds which is released to detennine if the reportable quantity has been exceeded.

	DEQE	CERCLA	TITLE III
	° Emissions from exhaust of an engine ° Consumer products in consumer use.	° Application of pesticide products registered under FIFRA and the handling and storage of such a pesticide product by an agricultural producer	° Releases which result in exposure to persons solely within the boundaries of a facility.
	° The normal application of fertilizer	° federally permitted releases as defined in Section 101(10) of CERCLA. Quantities in excess of permit are reportable.	° Federally permitted releases as defined in section 101(10) of CERCLA. Quantities in excess of permit are reportable.
	° The application of pesticides consistent with their labelling ° Releases covered by permit, license, approval, order, regulation or guideline issued under federal or state statute unless release exceeds allowable amount and presents imminent hazard.	° Statutory provisions for reduced reporting requirements for continuous releases as defined under section 103(f)(2) of CERCLA except for statistically significant increases as defined under section 103(3)f. Regulations being developed.	° Statutory provisions for reduced reporting requirements for continuous releases as defined under section 103(f)(2) of CERCLA except for statistically significant increases as defined under section 103(e). Regulations being developed.
	° Releases of petroleum based oil from a primary tank that are captured by a secondary tank		° Application of pesticide products registered under FIFRA and the handling and storage of such a pesticide product by an agricultural producer.
	° Releases of petroleum based oil captured, contained and within the design capacity of properly functioning oil water separators ° Releases of gasoline which result from tank ruptures during automobile accidents		° Any other release which is exempt from CERCLA section 103(a) reporting under section 101(22) of CERCLA
3. Reportable Quantities			
° Definition	° "The quantity of oil or hazardous material, the sudden, continuous or intermittent release or threat of release of which, in a period of one week, requires notification pursuant to these regulations, 310 CMR 40.00."	° The quantity set forth in 40 CFR, Part 302 Table 302.4, the release of which requires notification pursuant to Part 302.	° "For any CERCLA hazardous substances, the reportable quantity established in Table 302.4 of 40 CFR for such substance. For any other substance, the reportable quantity is one pound." (Extremely hazardous chemicals that aren't on CERCLA list have one pound RQ).

APPENDIX A

COMPARISON OF PROPOSED DEQE, CERCLA, AND TITLE III EMERGENCY NOTIFICATION REQUIREMENTS

Prepared by:
DEQE/Office of Incident Response

	DEQE	CERCLA	TITLE III
1. Substances Covered			
° Criteria for Listing	° acute toxicity (mammalian and aquatic), chronic toxicity, mutagenicity, carcinogenicity, ignitability, corrosivity, reactivity	° CERCLA list composed of the following source lists specified by statute: - 311(b)(4) of CWA - 307(a) of CWA - 112 of CAA - RCRA section 3001	° Acute toxicity
° Number of Listed Hazardous Materials	° ~1300 including 405 Extremely Hazardous Substances and 717 CERCLA Hazardous Substances	° 719 Hazardous Substances ° 757 Radionuclides ° 106 Waste Streams	° 405 Extremely Hazardous Substances and ° 719 CERCLA Hazardous Substances
° Unlisted Hazardous Materials	° Materials which exhibit one or more of the characteristics of ignitability, corrosivity, reactivity (as defined in the proposed regulations) or infectious material (as defined by DPH in 105 CMR 103.360-130.362) shall be subject to notification requirements of 310 CMR 40.000 if released in excess of 10 pounds.	° Unlisted hazardous substances and wastes which exhibit one or more of the characteristics of ignitability, corrosivity, or reactivity are subject to notification requirements of 40 CFR Part 302 if released in excess of 100 lbs.	No unlisted hazardous substances associated with emergency release reporting requirements
	° Unlisted hazardous wastes which exhibit EP Toxicity on the basis of one or more contaminants are subject to notifications requirements if the waste itself is released in an amount in excess of the RQ for the contaminant which exhibits EP Toxicity.	° Unlisted hazardous wastes which exhibit EP Toxicity on the basis of one or more contaminants are subject to notifications requirements if the waste itself is released in an amount in excess of the RQ for the contaminant which exhibits EP Toxicity.	
2. Exemptions			
	° Releases of radioactive material shall not require notification pursuant to 310 CMR 40.000 as notification of releases of these materials is adequately covered bu EPA, NRC and Massachusetts Department of Public Health (MDPH).	° Releases of crude oil, petroleum feed-stocks, refined petroleum products (waste oil is not excluded)	° Releases of hazardous chemicals which are under the supervision of a technically qualified individual at research laboratories, hospitals or other medical facilities are exempt from emergency notification requirements under SARA section 304.